

User's Guide

MAGNIA™ 3135R

TOSHIBA

Toshiba Magnia™ 3135R User's Guide

Important Numbers for Future Reference

Print out this page and record your computer serial number and part number here for future reference. If you are running Windows NT® or Windows® 2000, also record the Microsoft® operating system product key number. These numbers are located on labels that are affixed to your computer and are easily accessible prior to setup.

Serial number: _____

Part number: SYU_____U-_____

Microsoft Operating System Product Key Number:

BIOS version: _____

The BIOS version appears on screen during system boot

Contacting Toshiba

If you need assistance:

❖ www.support.toshiba.com

Download the latest drivers, view detailed installation instructions, and access the latest server information.

❖ InTouchsm Center

Calling within the United States (800) 457-7777

Calling from outside the United States (949) 859-4273

For troubleshooting information, see [If Something Goes Wrong](#) on page 155.

Model: Toshiba Magnia 3135R

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This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his own expense.



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- ❖ This device must accept any interference received, including interference that may cause undesired operation.

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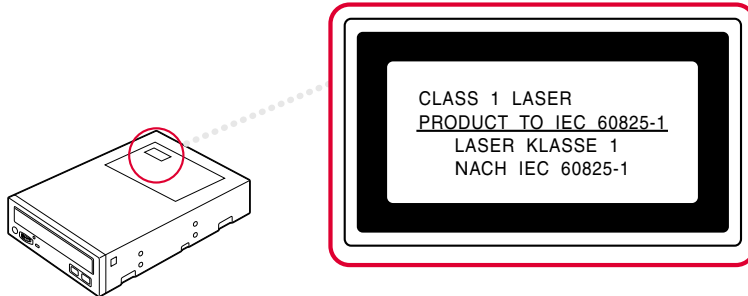
EMC-emission:	EN50081-1	1992	Residential, commercial & Light Industry Class B (Domestic environment) 230V/AC, 50Hz 230V/AC, 50Hz
	EN55022	1994	
	EN61000-3-2	1995	
	EN61000-3-3	1995	
EMC-immunity	EN55024	1998	Residential, commercial & Light Industry DO:8kV, AD:15kV 3V/m, 80-1000MHz, 1kHz 80% AM AC-line: 1kV, Signal-line: 0.5kV, f:5kHz, Polarity: +/- AC-line: 1kV/2kV, Polarity: +/- 3V/m.f, 0.15-80MHz, 80% AM 30% 500ms, 100% 10ms, >95% 5000ms
	EN61000-4-2	1995	
	EN61000-4-3	1998	
	EN61000-4-4	1995	
	EN61000-4-5	1995	
	EN61000-4-6	1997	
	EN61000-4-11	1994	
Safety:	EN60950	1992	
	A1	1993	
	A2	1993	
	A3	1995	
	A4	1997	
	A11	1997	

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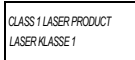
CD-ROM Safety Instruction

The CD-ROM drive employs a laser system. To ensure proper use of this product, please read the CD-ROM instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location. Use of controls, adjustments, or performance of procedures other than those specified may result in hazardous radiation exposure. To prevent direct exposure to the laser beam, do not try to open the enclosure.

Location of the Required Label



CAUTION: This appliance contains a laser system and is classified as a “CLASS 1 LASER PRODUCT.” To use this model properly, read the instruction manual carefully and keep it for your future reference. In case of any trouble with this model, please contact your nearest “AUTHORIZED service station.” To prevent direct exposure to the laser beam, do not try to open the enclosure.



Use of controls or adjustments or performance of procedures other than those specified in the owner's manual may result in hazardous radiation exposure.

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Introduction

Thank you for purchasing the Toshiba Magnia 3135R server, which combines high performance with great flexibility.

- ❖ The Toshiba Magnia 3135R is designed around the ServerWorks® ServerSet III LE (FSB 133 MHz).
- ❖ The 3135R supports up to two Intel® Pentium III processors.
- ❖ Flex PCI riser card with one 64 bit/66 MHz slot and one 32 bit/33 MHz slot provide add-in board capability.
- ❖ The integrated onboard video controller has 4MB of video memory.
- ❖ The 3135R comes with an integrated onboard Network Interface Controller (NIC), using an Intel® 82559 single chip PCI LAN controller for 10 or 100 Mbps TX Fast Ethernet networks.
- ❖ Thermal/voltage monitoring and error handling are provided.
- ❖ Front panel controls and indicators (LEDs) are present for system operation.
- ❖ The 3135R includes an onboard SCSI controller with Adaptec AIC-7899 supporting onboard Ultra160 and Ultra-wide SCSI Interfaces.
- ❖ Memory is expandable from 128 MB to 4GB using registered DIMMs.

About This Guide

This guide introduces the features of the Toshiba Magnia 3135R server and explains how to set up, configure, and maintain the server. Before using your Toshiba server, refer to this guide to gain an overall understanding of operating procedures and safety precautions.

Other Documentation and Software

In addition to this user's guide, Toshiba provides a system CD that contains:

- ❖ The *Safety Instruction Guide for Toshiba Servers*, which contains general safety information.

Toshiba also provides you with:

- ❖ A *Toshiba Magnia™ 3135R Quick Start Card*, which identifies the major server components, and provides a quick reference on connection, setup, and system configuration information.
- ❖ Warranty information

Safety Icons

Read and understand all safety instructions before attempting to use your Toshiba Magnia 3135R server.

This guide contains the safety instructions that must be observed in order to avoid personal injury or damage to your server. The safety instructions have been classified according to the seriousness of the risk, and the following icons highlight these instructions.



DANGER: This icon indicates the existence of a hazard that could result in death or serious bodily injury if the safety instruction is not observed.



CAUTION: This icon indicates the existence of a hazard that could result in damage to equipment or property if the safety instruction is not observed. A caution also indicates a potential loss of data.



WARNING: This icon indicates the existence of a hazard that could result in bodily injury if the safety instruction is not observed.



NOTE: This icon indicates information that relates to the safe operation of the equipment or related items.

It is extremely important to follow basic safety practices are followed when installing and maintaining the system.

Other Icons

Additional icons highlight other helpful or educational information:



TECHNICAL NOTE: This icon highlights technical information about the server.



HINT: This icon denotes helpful hints and tips.



DEFINITION: This icon indicates the definition of a term used in the text.

Service Options

Toshiba offers a full line of service options built around its warranty programs. For registration information refer to the warranty and service material included with the server, or go to our web site at: <http://www.support.toshiba.com>.

Maintenance Contracts

Periodic maintenance and inspection is essential to keeping the server fully operational and assuring its safe use. Toshiba recommends taking out a maintenance contract with an authorized Toshiba Magnia service provider.

Cleaning the Server

If the server's exterior case is dirty or stained, clean it with a soft cloth. If necessary, moisten the cloth with water. Never use harsh chemicals to clean the server.

Setting Up Your Work Environment

You can work more comfortably and efficiently by thoughtfully organizing your work space. Developing good work habits is the best way to avoid strain and stress to your hands, back, neck and eyes.



WARNING: Using the computer keyboard incorrectly may result in discomfort and possible injury. If your hands, wrists, and/or arms bother you while typing, stop using the computer and rest. If the discomfort persists, consult a physician.

Developing Good Work Habits

The key to avoiding discomfort or injury from repetitive strain is to vary your activities. If possible, schedule a variety of tasks into your working day. Finding ways to break up the routine can reduce stress and improve your efficiency.

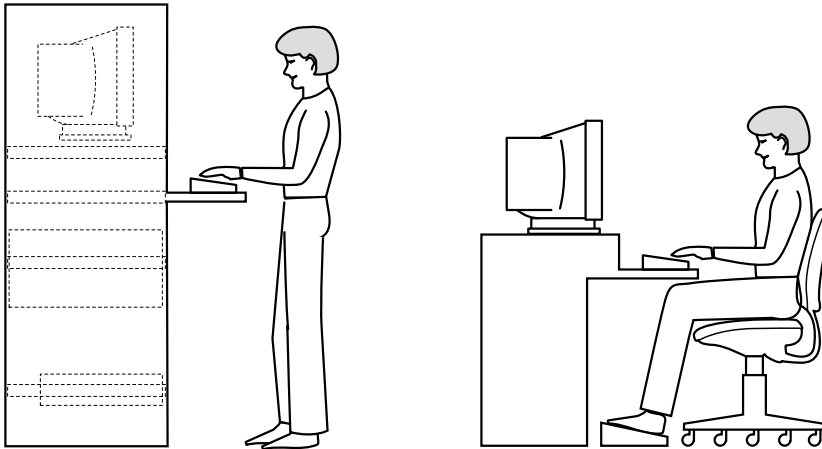
- ❖ Take pauses from typing.
- ❖ Take short breaks to change position, stretch your muscles, and rest your eyes. A two or three minute break every half hour is more effective than one long break after several hours.
- ❖ Stretch spontaneously throughout the day to reduce tension.
- ❖ Avoid performing repetitive activities for long periods. Intersperse repetitive activities with other tasks.
- ❖ Look away from the computer every 15 minutes or so to reduce eye strain, and focus your eyes on a distant object for 30 seconds.

Arranging Your Work Area

Carefully planned placement of your computer and desktop tools can help you avoid stress-related injuries and help you work more efficiently. Adjusting the lighting can make it easier to see your work and reduce eye strain.

- ❖ Place the keyboard on a flat surface, directly in front of you, at a comfortable distance. When you use the keyboard, your arms and hands should be in a relaxed position with your forearms parallel to the floor. You should be able to type without twisting your body or neck.
- ❖ Place the monitor so that its top is at eye level. If you wear bifocal or progressive lenses, position the monitor slightly lower.
- ❖ Set your paper holder at the same distance as the screen. If possible, adjust the holder so that the paper is at the same height as the screen.
- ❖ Position the monitor so that sunlight or bright indoor lighting does not reflect off the screen. Use tinted windows or shades to reduce glare.
- ❖ Adjust the screen to avoid reflections and glare.
- ❖ Avoid placing the monitor in front of a bright light that could shine directly in your eyes.
- ❖ If possible, use soft, indirect lighting in your computer work area.

Seating and Posture



Correct posture and computer placement

When using the computer, sit comfortably. Proper seating is a primary factor in reducing strain.

- ❖ Position your chair so that the keyboard is at or slightly below the level of your elbow. You should be able to type comfortably with your shoulders relaxed.
- ❖ Position your knees should be slightly higher than your hips. If necessary, use a footrest to raise the level of your knees and ease the pressure on the back of your thighs.
- ❖ Adjust the back of your chair so that it supports the lower curve of your spine. If necessary, use a cushion to provide extra back support.
- ❖ Sit with your back straight so that your knees, hips and elbows form approximately 90-degree angles when you work. Do not slump forward or lean back too far.

Using Your Arms and Wrists

Regular attention to your work habits can make your time at the computer more productive.

- ❖ Keep your wrists straight while typing. If necessary, adjust the keyboard and chair height to keep wrists straight.
- ❖ Avoid resting on your wrists while typing.
- ❖ Use a light touch on the keys and mouse.
- ❖ Avoid bending, arching, or twisting your wrists. Keep them in a relaxed, neutral position while typing.
- ❖ Exercise your hands, wrists and arms several times during the day to improve circulation.

Chapter 1

Getting Started

This chapter provides a detailed description of the server and the environmental conditions in which it is designed to operate.

Make Sure You Have Everything

Unpack the boxes and check the contents against your purchase order. If the server contains optional devices, those components will also be listed. If any items are missing or damaged, notify your Toshiba representative immediately.

Installing Optional Internal Devices

Install all optional devices before setting up the server. The installation and configuration procedures described in this guide require specific technical knowledge and experience. If you have no experience installing and removing computer hardware devices, or if the job seems difficult, consult an authorized Toshiba Magnia service provider. Toshiba assumes no liability for damages if you install and remove optional devices yourself.

Environmental Considerations

This section lists precautionary measures that should be followed when setting up rack-mounted Toshiba Magnia 3135R servers.

General Environmental Considerations

- ❖ Install the server in a clean, dust-free and well-ventilated place.
- ❖ Install the server on a level and steady surface.
- ❖ Never install the server upside down.

❖ Never install the server in any of the following places:

- Where it will be exposed to direct sunlight
- Where it will be exposed to vibration or shock
- Near any devices that generate a strong magnetic field or produce radio frequency noise such as a radio, TV, large motor or loudspeaker
- Where the temperature and humidity change constantly; for example, near an air-conditioning vent, fan, heater or heat source
- Near liquids or corrosive chemicals

If debris or liquid gets in the server, shut it down immediately by turning the power button Off and unplugging the power cable from the AC outlet. Do not turn the server back on. Contact an authorized Toshiba Magnia service provider immediately.

Operate the server under the following temperature and humidity conditions:

Ambient temperature:

The operating temperature of the server, when installed in an equipment rack, must not go below 5 °C (41 °F) or rise above 32 °C (89 °F).

Relative humidity:

30% to 80% Rh (no condensation)



CAUTION: Avoid exposing the server to condensation during use and storage. Condensation can corrode server components and short-circuit its electrical circuits if the unit is on.

Ventilation:

The equipment rack must provide sufficient airflow to the front of the server to maintain proper cooling. It must also include ventilation sufficient to exhaust a maximum of 1,500 BTU per hour for each server. The rack selected and the ventilation provided must be suitable to the environment in which the server is used.

To avoid damage from condensation when the room temperature is too high or too low, wait about an hour before turning the server on. The delay allows the server to adjust to the ambient room conditions.

Environmental Considerations for Rack Mount Models



NOTE: Installing a Toshiba Magnia 3135R in a rack requires special knowledge and skills. Toshiba recommends that you contact an authorized Toshiba Magnia service provider.

In addition to the general environmental considerations, keep these additional points in mind:

- ❖ Use the optional Toshiba rack and rack mounting kit to install a rack model server.
- ❖ Provide sufficient airflow to the server to maintain proper cooling. Allow 51 inches (130 cm) of clearance in front of, and 24 inches (60 cm) behind the rack.

For more information on environmental considerations for a rack-mounted server, see [Environmental Considerations](#) on page 34 and [Selecting a Location for the Server in the Rack](#) on page 36.

Power Requirements

The power supply unit has maximum current ratings of 4.6 amperes with input voltages of 100-200 volts (at 50/60 Hz), or 2.3 amperes with input voltages of 200-240 volts (at 50/60 Hz), with 10 amp over-current protective circuits.

Before plugging the power cable into a wall outlet, make sure that the AC power source and the over-current protector (circuit breaker current rating) are sufficient to handle the requirements of the server and its connected peripheral devices.

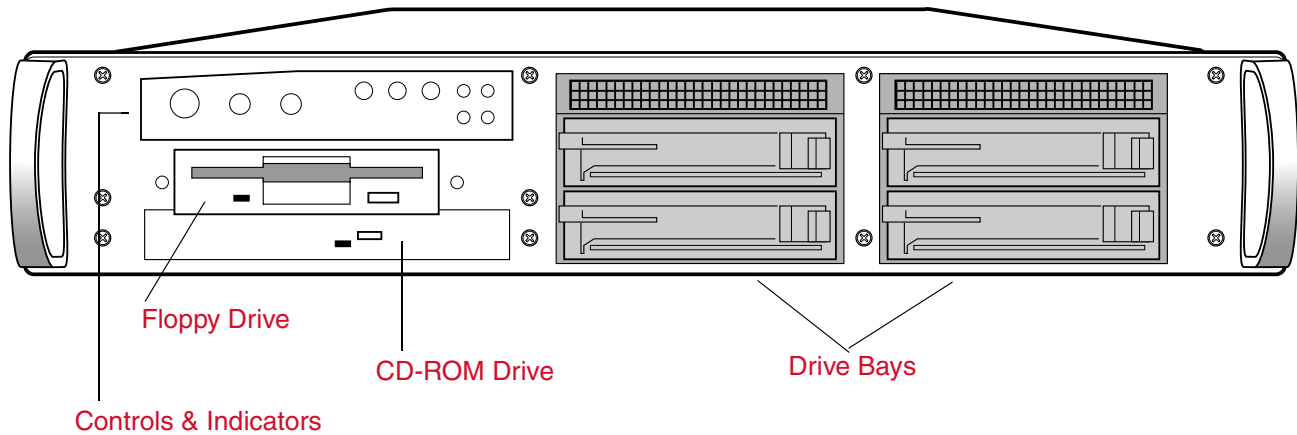
The current rating of the server is 4 amps. To ensure a continuous supply of power to the server, Toshiba recommends the use of an uninterruptible power supply (UPS).



WARNING: To ensure proper grounding of the server and avoid a possible fire hazard, use the power cable provided with the server.

If you have questions about the wiring of your AC power source, consult an authorized Toshiba Magnia service provider.

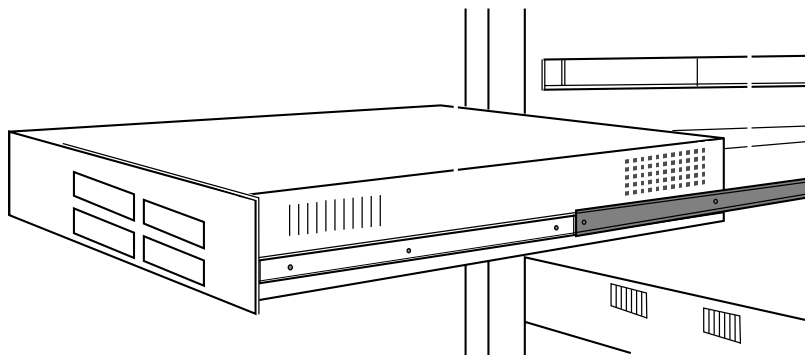
Front Panel



Front Panel

The front panel provides protection for, and access to, the controls and indicators, as well as the drive bays containing the hard disk drive (HDD), the CD-ROM drive, and a floppy disk drive (FDD).

Toshiba Magnia 3135R Mounted in a Rack

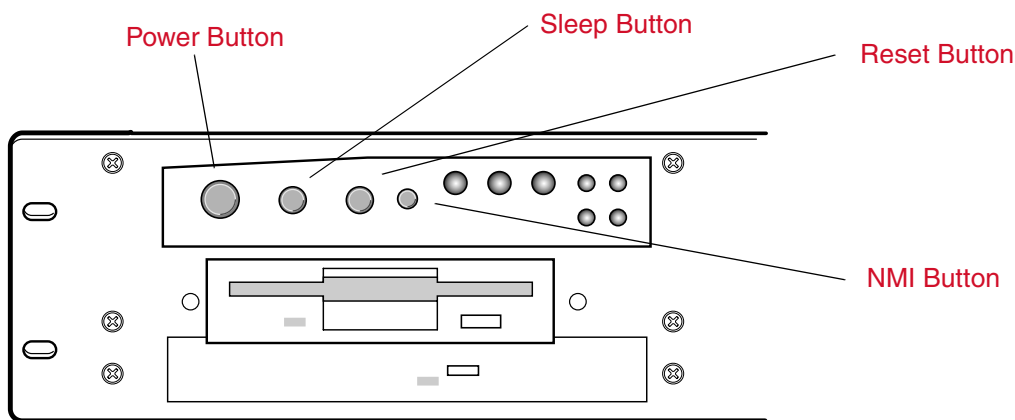


Rack Mounted Server

Controls and Indicators

The front panel contains four operation control buttons and seven system indicator LEDs.

Operation Buttons



Operation buttons



Power button - Press this button to power-down the server. Placing the server in security mode disables the power button. To power-down the server while it is in secure mode, the user must have shutdown rights. To reactivate the power button, enter your user password.



TECHNICAL NOTE: The procedure for shutting down the server depends on the operating system installed on the server. For more information on turning the server on and off, see [Turning on the Server](#) on page 45.



Sleep button - Toggles the server between normal operation mode and power-saving mode (sleep mode). Placing the server in secure mode disables the sleep button. To place the server in sleep mode while in secure mode, you must have sleep rights. To reactivate the sleep button, enter your user password.



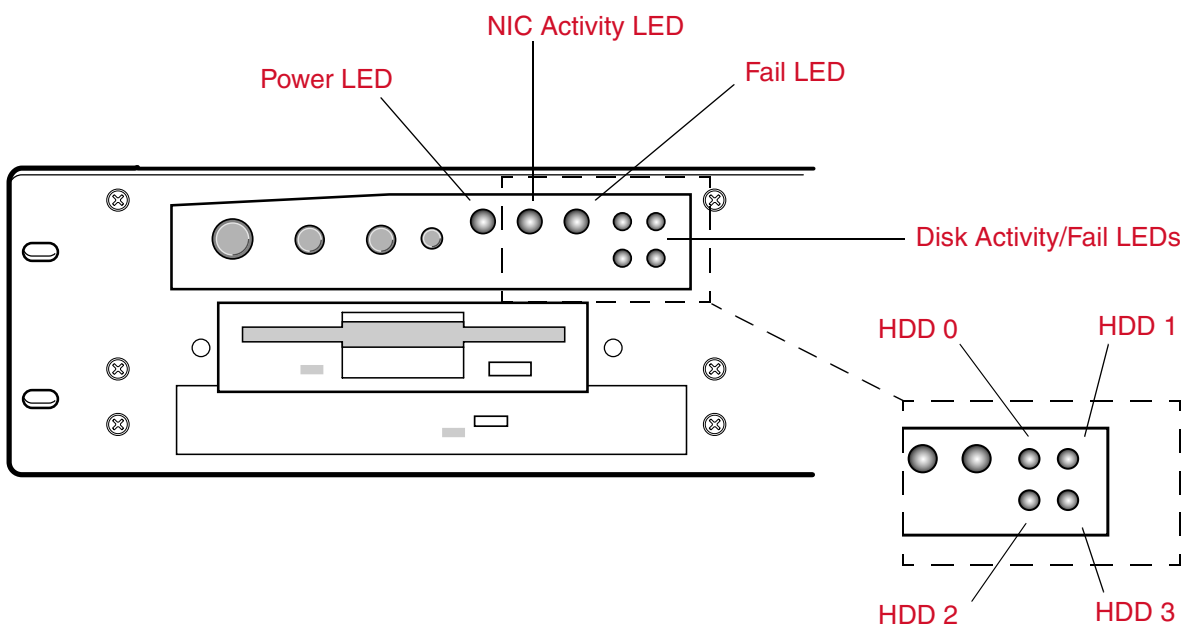
Reset button - Restarts the server. Placing the server in security mode disables the Reset button. To re-enable the Reset button, enter your user password.



CAUTION: To avoid data loss or corruption, never use the Reset button while the activity indicator on the floppy disk drive, CD-ROM drive, or hard disk drive is on.

NMI button - This is a system control button, to be used by authorized Toshiba Service personnel only.

System and HDD Status Indicators



System indicators

The following table describes the operation of the system indicators.

Indicator	Status	Description
Power	Off	System power off
	Green	Server is running normally
	Flashing Green	ACPI standby mode
NIC Activity	Off	No LAN activity
	Green	Network Interface Controller active
System Fail	Off	Normal
	Amber	System Failed
	Flashing Amber	System warning
Disk Activity/Fail (0)	Off	No power supplied to SCSI drive
	Green	SCSI drive active
	Amber	SCSI drive failed
Disk Activity/Fail (1)	Off	No power supplied to SCSI drive
	Green	SCSI drive active
	Amber	SCSI drive failed
Disk Activity/Fail (2)	Off	No power supplied to SCSI drive
	Green	SCSI drive active
	Amber	SCSI drive failed

Indicator	Status	Description
Disk Activity/Fail (3)	Off	No power supplied to SCSI drive
	Green	SCSI drive active
	Amber	SCSI drive failed

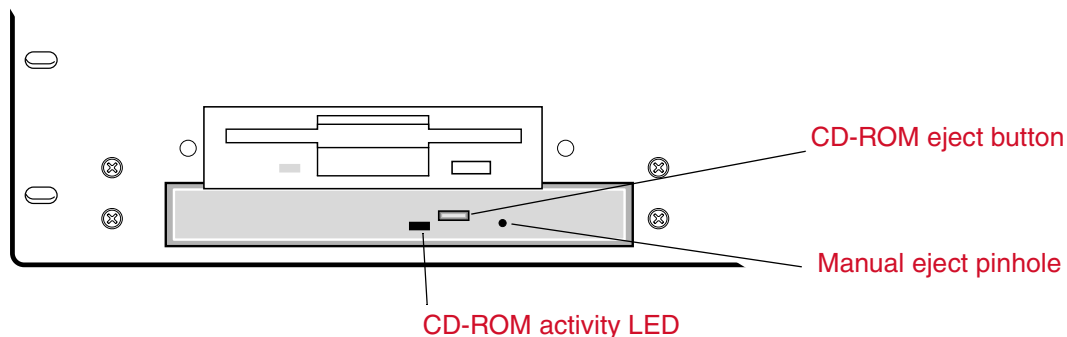
Determining Network Communication Status (NIC LEDs)

LED Color	LED On	LED Blinking	LED Off
Amber	100-Mbps network connection	N/A	10-Mbps network connection
Green	Linked to network, no network traffic	Linked to network, sending or receiving data	Not linked to network

Device Bays

The Toshiba Magnia 3135R supports five device bays. Four are "Hot Swap" bays, supporting up to four Hard Disk Drives. The other device bay contains a Floppy Disk Drive and a Slim CD-ROM.

CD-ROM Drive



Front View of CD-ROM buttons and indicator

Manual eject pinhole - Use to manually release the disc tray if it does not open when you press the eject button while the server is on. To release the disc tray, insert a slender object, such as a straightened paper clip, through the pinhole and press gently.



CAUTION: To avoid damage to the CD-ROM drive when manually ejecting a compact disc, turn off the server before manually opening the disc tray. Never use pointed objects to release the disc tray. The object could break and damage the drive. Always remember to remove the CD whenever the drive is not in use.

Activity indicator - Illuminates when the CD-ROM is being accessed.

Eject button - Used to open and close the disc tray.



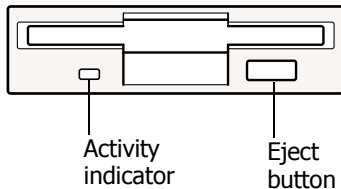
TECHNICAL NOTE: Be sure to verify that any CD is inserted flatly into the drive tray to avoid damaging the media when the tray closes.



CAUTION: To avoid damaging the CD-ROM drive, never press the eject button while the status indicator is on.

Floppy Disk Drive

The FDD supports 3.5-inch, double-density (720-KB), and high-density (1.44-MB) diskettes.



Activity indicator - Illuminates whenever the floppy disk drive reads or writes data.

Eject button - Releases the diskette from the drive.



CAUTION: To avoid losing or corrupting data stored on the diskette, never press the eject button while the FDD indicator is on. Always remove the diskette from the floppy disk drive whenever the drive is not in use.

Cooling Fan Unit

To regulate the temperature inside the server, the Toshiba Magnia 3135R is equipped with the following cooling fans:

- ❖ Two 80mm system fans mounted in the middle of the chassis
- ❖ Power Supply fan internal to the power supply
- ❖ One CPU fan mounted on each processor

Removal and replacement of a system fan is easily accomplished by powering the system down, removing the top cover, and removing the fan assembly. There is also a cooling fan internal to the power supply.

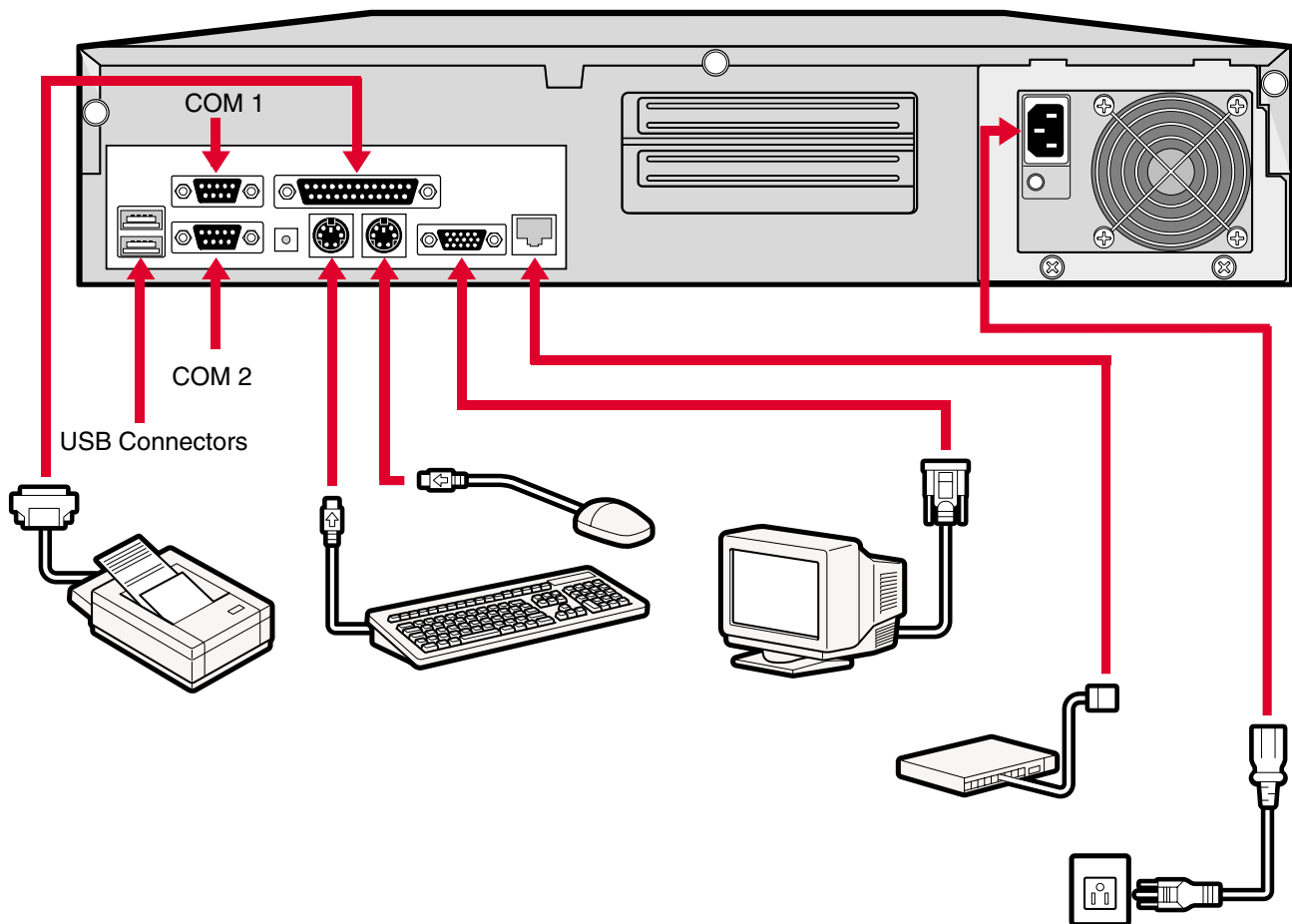
Rear Panel

Identifying the AC Power Connector and I/O Signal Ports

This section provides a description of the server's AC power connector and I/O ports. It also provides information on connecting peripheral devices to the server.



TECHNICAL NOTE: The output voltages from the I/O connectors on the back of the server do not exceed 12V.



Rear panel connections

Using USB-Compliant Devices



TECHNICAL NOTE: Before connecting a USB-compatible device, check whether the operating system installed on your server supports the USB standard.

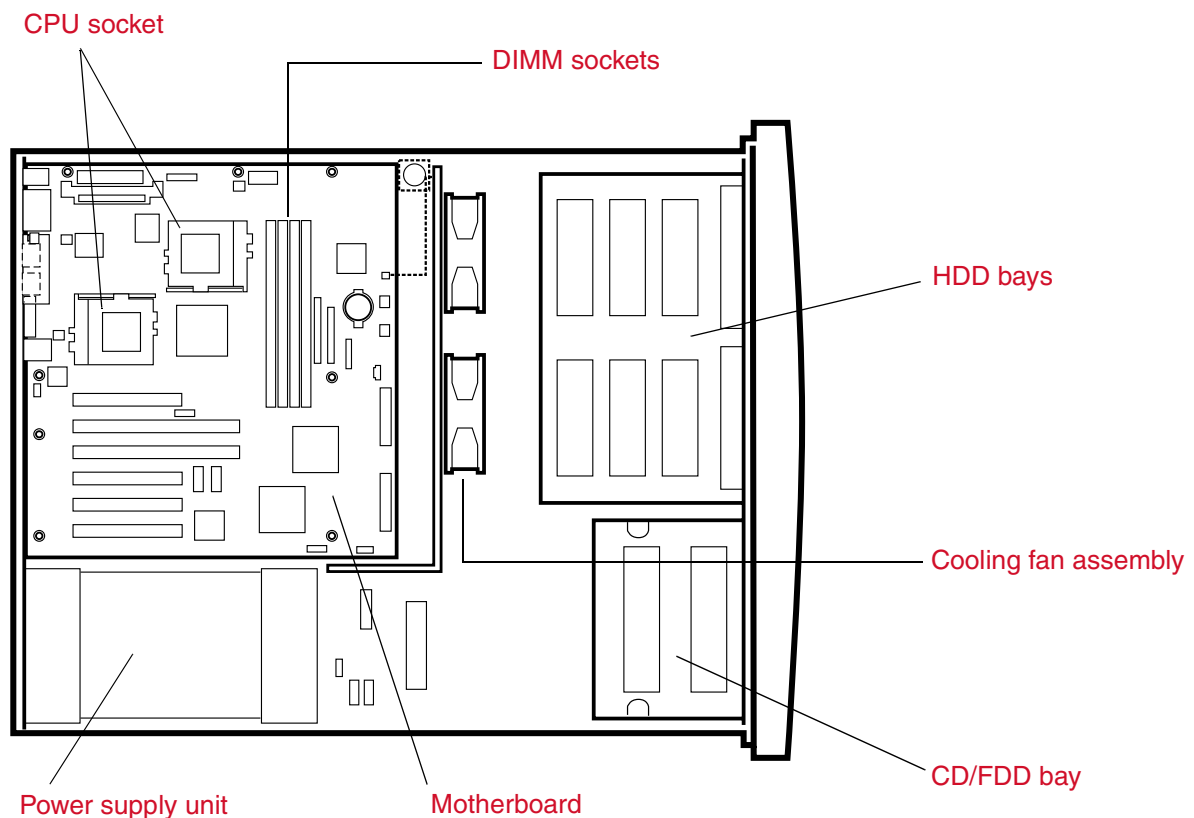
Keep in mind the following considerations

- ❖ A USB-compatible keyboard or mouse cannot be used with BIOS setup or the Hardware Diagnostics Program.
- ❖ Windows NT 4.0 and Novell NetWare do not support the USB standard.



TECHNICAL NOTE: The BIOS installed in the Magnia 3135R does not support PS/2 emulation when using a USB keyboard.

Inside the Server



Top View of major system components

Motherboard

The motherboard contains two CPU sockets, four DIMM sockets, and two PCI expansion card slots on the riser board.

CPU Sockets

The Toshiba Magnia 3135R contains two CPU sockets. For instructions on installing and removing a processor, see [CPU Modules](#) on page 61.

Internal Battery

The lithium battery on the server board powers the real-time clock (RTC) for up to 5 years in the absence of power. When the battery starts to weaken, it loses voltage and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. For instructions on replacing the RTC battery, see [Replacing the Internal Battery](#) on page 71.

Memory Bank

The memory bank contains four slots, supporting installation of up to four memory modules. For system memory upgrade information, see [Memory Modules](#) on page 56.

Expansion Slots

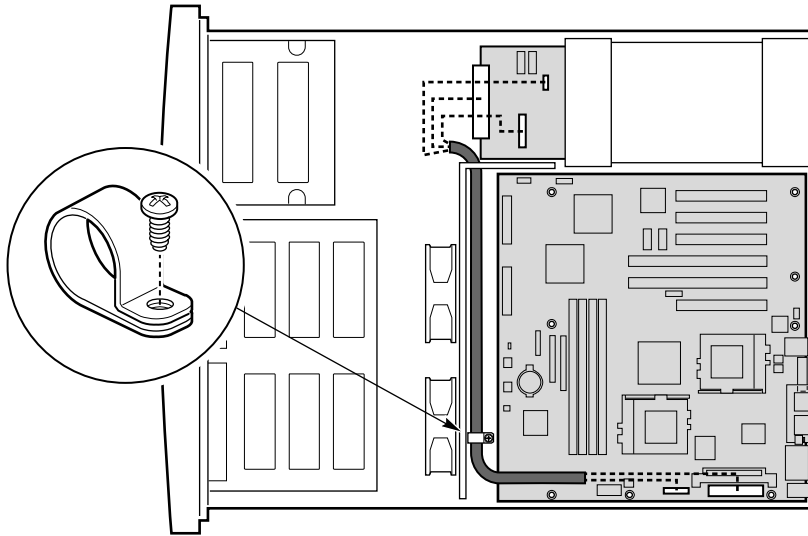
The Toshiba Magnia 3135R supports the addition of two PCI cards. Both PCI slots are located on the riser card which has two full-length standard PCI connectors



CAUTION: Do not use any expansion slots on the server board

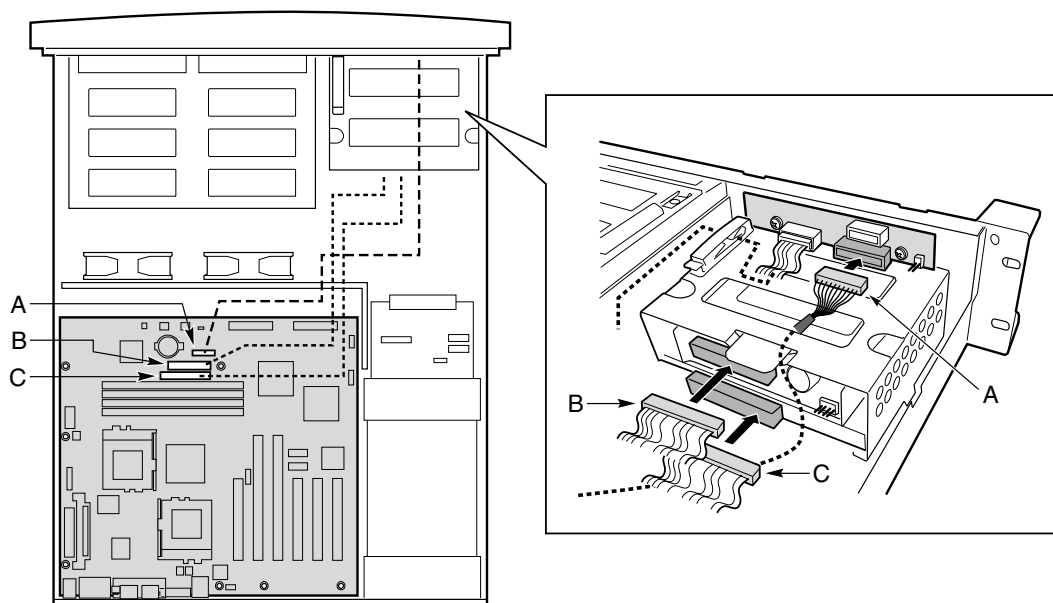
Cabling the Server Board

- 1 Route the power cable on the board side of the fan as shown in the following illustration. Wrap the clamp around the cable and secure it to one of the unused standoffs.



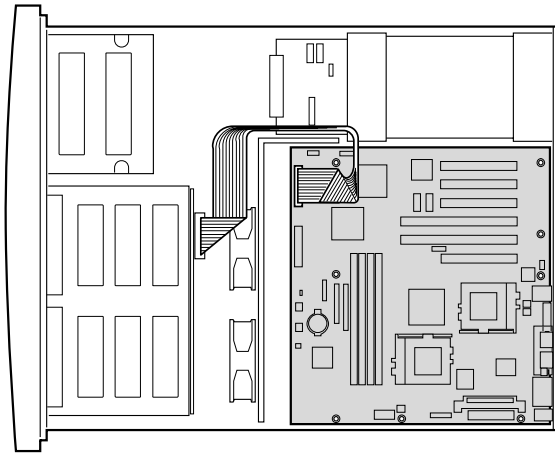
Routing the Power Cable

- 2 Connect the cable shipped with the server board to the bottom connector (A).
- 3 Connect the diskette drive data cable (B).
- 4 Connect the CD-ROM data cable (C).



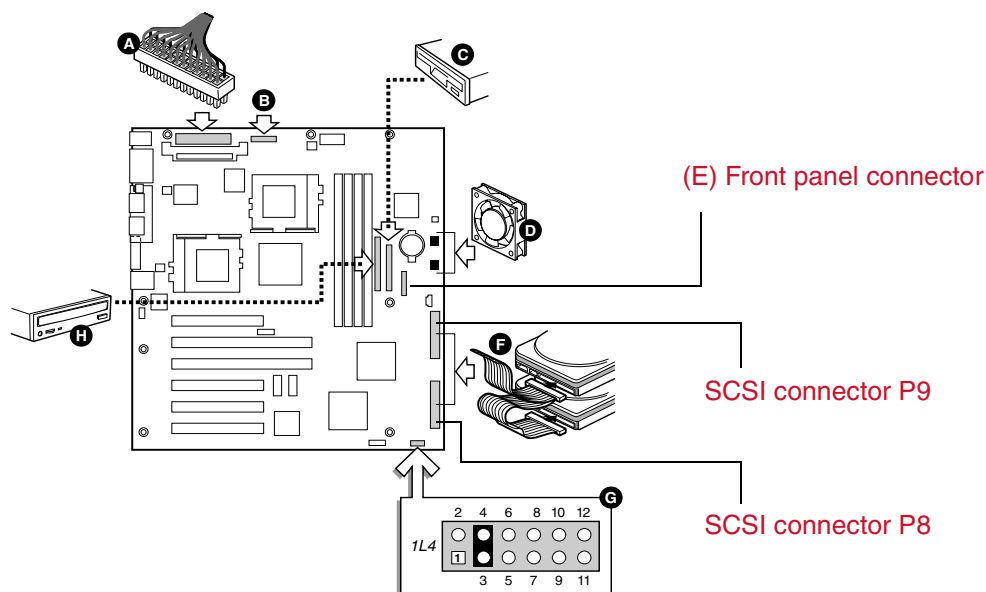
Connecting the front panel board cables

- 5** If not already connected, connect the SCSI cable.



Connecting the SCSI cable

- 6** Connect the power cables (A) and the server board AUX connector (B).
- 7** Connect the diskette drive cable (C).
- 8** Connect the power cables for fan 1 to the FAN2A connector and fan 2 to the FAN3A connector (D).
- 9** Connect the front panel cable (E).
- 10** Connect the SCSI connector from the hot swap cable to SCSI connector P8 (F).
- 11** Connect the chassis intrusion switch cable to pins 3-4 of connector 1L4 (G).
- 12** Connect the CD-ROM IDE cable (H).



Connecting cables to the server board (see [Jumper Settings](#) on page 173 for details on jumper settings)

Connecting Peripheral Devices

- 1** Make sure that the server, and all connected peripheral devices, are turned off and that their power cables are not plugged into an AC outlet.
- 2** Using the proper interface cable, connect each peripheral device to an appropriate connector on the server. If the plug on the interface cable has thumbscrews, tighten the thumbscrews sufficiently to secure the cable.
- 3** Plug the power cables from the server and peripheral devices into AC outlets. Make sure all peripheral devices are properly connected before turning on the server.

Installing the Server in a Rack

This section contains information and instructions on installing the server in a rack.

Choosing a Location

Choose an appropriate location for the server that is structurally and environmentally suitable for the equipment.

Structural Considerations

Make sure the floor or supporting surface can support the weight of the rack when fully loaded. In addition, make sure that the distance from the surface supporting the rack to the ceiling is sufficient to allow air to flow freely. Ensure that there is enough space around the rack to allow for server installation and maintenance.

Environmental Considerations

Install the rack on a level surface in a clean, dust-free, and well-ventilated environment. The area should be free from:

- ❖ Direct sunlight
- ❖ Vibration
- ❖ Liquids and corrosive chemicals
- ❖ Equipment that generates a strong electromagnetic field, such as large motors or speaker phones
- ❖ Rapid changes in temperature or humidity and sources of temperature change such as air conditioner vents, fans, or heaters
- ❖ Extreme heat, cold, or humidity. Adhere to the following temperature and humidity guidelines:

Temperature: 50 to 89 degrees F (10 to 32 degrees C)

Relative humidity: 40% to 80% (non-condensation)

If the ambient temperature is too high or too low, wait about an hour after the temperature is within operational range before using the server.



CAUTION: To prevent damage to equipment, keep the rack and server free from condensation during use and storage.

Also, make sure that there is sufficient unrestricted airflow around the rack to ensure proper cooling of the server components mounted in the rack.

The recommended clearances are:

Front:	51 inches	(130 cm)
Rear:	24 inches	(60 cm)
Overhead:	13 inches	(34 cm)

Power Considerations

There are three ways to supply power to the equipment installed in the rack:

- ❖ Connect the AC cables from the equipment directly to an AC outlet. Make sure that the necessary number of outlets are within reach of the power cables.
- ❖ Install an optional AC power strip in the rack and connect the installed equipment to the power strip. The AC power strip should comply to NEMA L5-15P (3-prong straight, 115V/15A) specifications. If you connect your rack equipment in this manner, make sure that the total current requirement of the equipment is less than 15 amps.
- ❖ Install an Uninterruptible Power Supply (UPS) in the rack. Make sure that you have a sufficient number of UPS units to handle the expected equipment load.



WARNING: To avoid electrical shock or fire, always use a grounded 115V AC outlet or power strip to provide electrical power to rack components.

Even though some racks do not require a dedicated ground, depending on the environment, a separate ground may be necessary.

Preparing the Rack

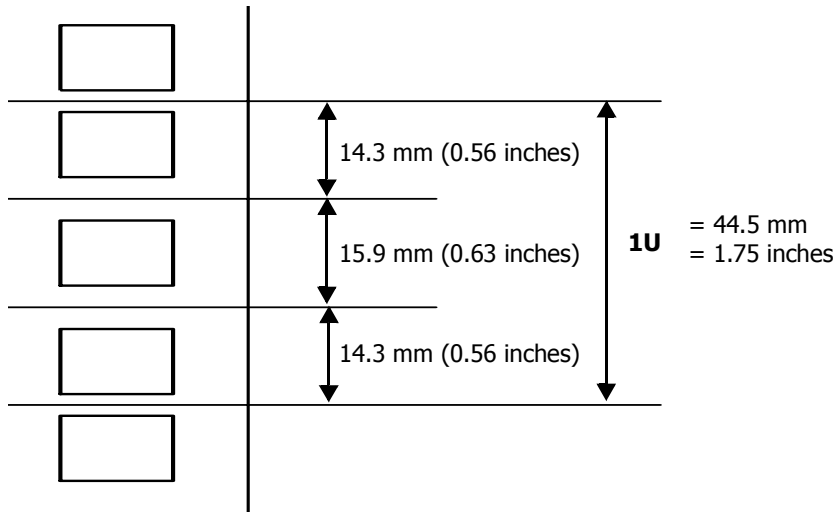
Decide what equipment will be mounted in the rack and where each device will be installed. Your rack configuration may include a monitor tray, one or more servers, a keyboard drawer, and a UPS.



DANGER: To prevent the rack from becoming unstable and top heavy, install components in the rack from the bottom up. Install the heavier components as close to the bottom of the rack as possible.

Selecting a Location for the Server in the Rack

The following illustration shows the distance between the narrow-pitch spaces on a standard 19-inch rack. For a full-size template of the rack-mount units, see [Using the Template](#) on page 181.



1U height on a 19-inch rail



DEFINITION: A "U" is a unit of vertical rack space. "1U" is defined as the distance between two narrow-pitch spaces on a 19-inch vertical rail.

Equipment Mounting Guidelines

Follow these guidelines when mounting equipment:

- ❖ Make sure there is adequate room for all devices and cabling.
- ❖ Calculate the total weight and the power requirements of the components prior to installation.
- ❖ Mount equipment starting at the bottom of the rack moving upward. To increase stability, mount the heaviest components as close to the bottom of the rack as possible. Unused space should be at the top of the rack.

Stabilizing the Rack



WARNING: To prevent the rack from tipping forward under normal conditions, use stabilizers to secure the rack. Depending on the equipment mounted in the rack and the location of each component, the rack may become unstable if the stabilizers are not installed. Stabilizers are not designed to withstand unusual stresses, such as those that may be caused by an earthquake.

Typically, stabilizers can be installed two ways, with varying levels of stability:

- ❖ Free-standing stabilizers
- ❖ Anchored stabilizers (secured to the floor)

Free-Standing Stabilizers

Front and rear stabilizers should be installed to reduce the possibility of the rack tipping over while equipment is accessed for service. Additional optional side stabilizers can be installed to widen the footprint of the rack and reduce the possibility of the rack tipping over under adverse conditions.

Secured Stabilizers

Stabilizers can be installed and then bolted to the floor, permanently securing the rack in place. To ensure that the rack is secured properly, consult or commission a licensed contractor to perform the work.

Recommended Tools

To mount components in a rack, Toshiba suggests that you have these tools:

Tool	Use
Small and large Phillips screwdrivers	To tighten M3, M4, and M6 mounting hardware screws
Small and large flat-blade screwdriver	To install and remove screws on the installed components
Multimeter	To check wiring continuity
Antistatic wrist strap	To protect sensitive electronics

Toshiba-Supplied Hardware Items

The following table lists the hardware items that Toshiba provides with your server.

Hardware item	Qty	Use
M5 x 12 screw	12	Use to secure the base rail to the rack's vertical rails.
M5 star washer	8	Use to secure the base rail to the rack's vertical rails.
M5 flat washer	8	Use to secure the base rail to the rack's vertical rails.
Inside Rail	2	Chassis Rail: attaches to 3135R chassis (one left, one right).
Outer and Middle Rail Piece	2	Rack rail: attach to rack mounts. Chassis rail slides into this rail (one left, one right).
Front & Rear Rail Bracket Pair	2	Rack-to-Rail connecting bracket pairs (left front/right front, left rear/right rear)
Nutbar	4	Rack-to-Rail Nutbar: connects rack-to-rail connecting brackets to the rack.

Installing the Rail Rack and Mounting the Server

The Toshiba Magnia 3135R is delivered with a rail kit for rack mounting in a four-post network server cabinet. If your cabinet is not of this general type, you will have to purchase a separate rail kit that is designed for use with your cabinet.

Follow these steps to install the rail kit and place your system into the cabinet.

- 1 Assemble tools and miscellaneous parts.
- 2 Remove the inside piece (C in Figure Step 2) from both sides of the rail system. To remove an inside piece of the rail system, slide the part as far out as you can. This action reveals a brass colored finger tab (D in Figure Step 2) that when depressed allows you to completely separate the inside rail piece from the outer (A in Figure Step 2) and middle (B in Figure Step 2) rail pieces.

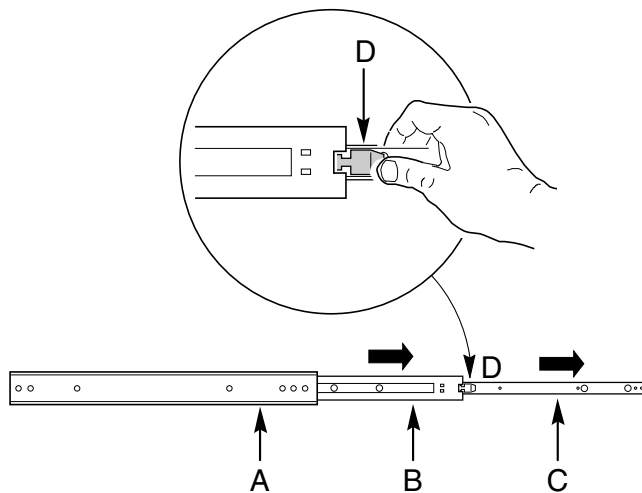


Figure: Step 2

- 3** Align each inside rail (A in Figure Step 3) to a side of the chassis. Be sure that the flat end of the inside rail is toward the front of the chassis and that the brass colored finger tab (D in Figure Step 3) is facing outward. With the holes in the chassis (C in Figure Step 3) aligned with the holes in the rail, fasten the rail using the largest screws (B in Figure Step 3) supplied with the rail kit.

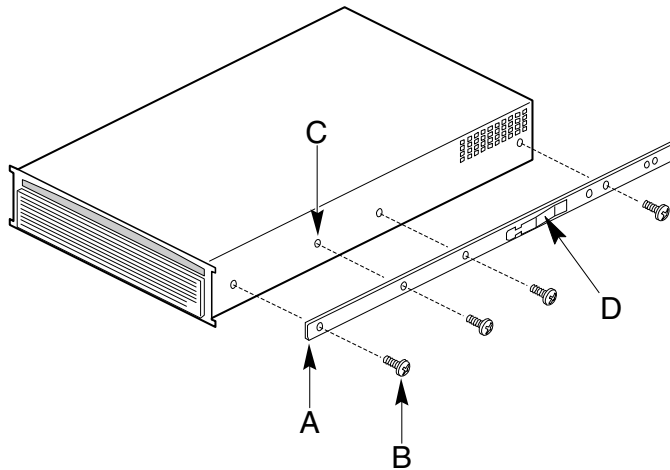


Figure: Step 3

- 4** Locate the front and rear rail brackets for one side of the rail kit. One pair (A and B in Figure Step 4) exists for each side of the cabinet rack.

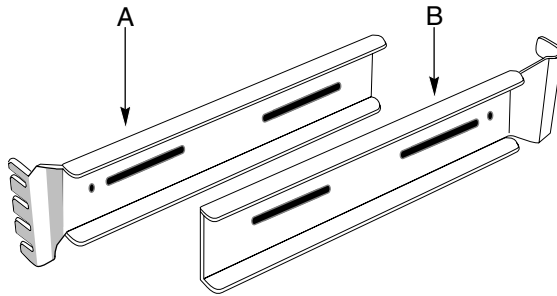


Figure: Step 4

- 5** Attach all four rail brackets to the cabinet rack. Be sure that the sharper angled side of each bracket is facing up (C in Figure Step 5). Use eight mounting screws provided by the manufacturer of the cabinet rack. In the illustration to the right, the left photo (A in Figure Step 5) shows the left-front bracket attached to the cabinet, while the right photo (B in Figure Step 5) shows the left-rear bracket. (The illustration shows the rails inside the brackets. You should not have the rails attached inside the brackets yet.)

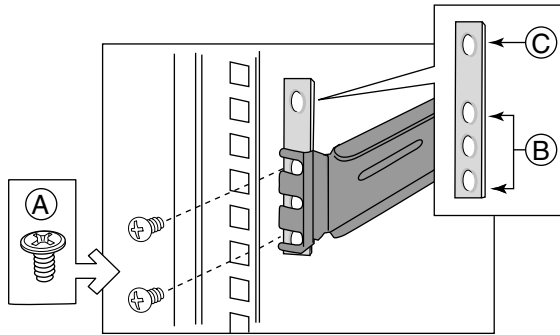


Figure: Step 5

- 6** Attach the system side rail outer pieces (total of two) to the rail brackets you installed in step 5. To attach the front part of an outer piece to a rail bracket, you must reveal the access hole (A in Figure Step 6) by sliding the innermost piece toward the back. Once you see the access hole, align it with the slot in the rail bracket in order to secure the bolt. Do not tighten the nut and bolt until you have aligned the rear portion of the rail system (see Step 7).

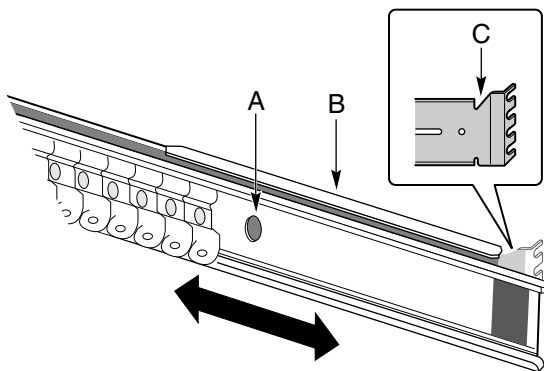


Figure: Step 6

- 7** To attach the rear part of the rail system to the rear rail bracket (A in Figure Step 7), slide the rail system within the rail brackets so that you can place a bolt through the hole in the rail (B in Figure Step 7) and into the rail bracket slot. Loosely tighten the bolt and nut. You should be able to slide the entire rail system back and forth in the rail brackets. When you have centered the rails in the bracket, tighten the fastening bolts and nuts.

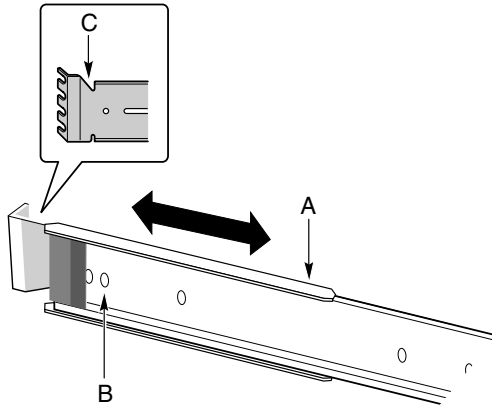


Figure: Step 7

- 8** Extend the right and left rails so they fully extend in front of the cabinet rack. The rail system is now ready to receive the chassis.

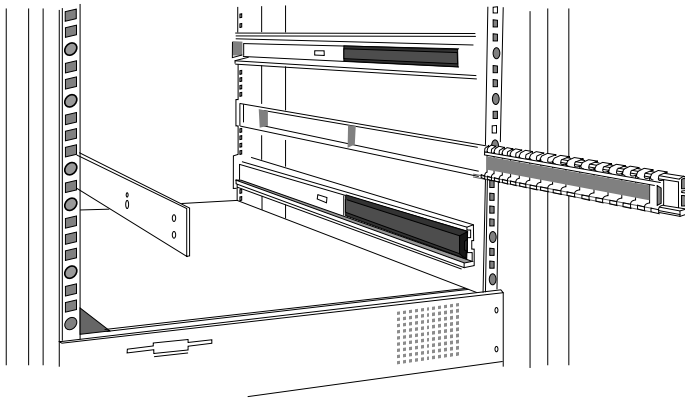


Figure: Step 8

- 9 Lift the chassis with the front facing you and carefully guide the inner rail (A in Figure Step 9), which is mounted to the chassis system, into the outer pieces (B in Figure Step 9) that you attached in previous steps. Gently move the system evenly towards the rear of the cabinet. Be sure to depress the brass colored finger tabs located in the center of each inner side rail piece as you slide the chassis back.

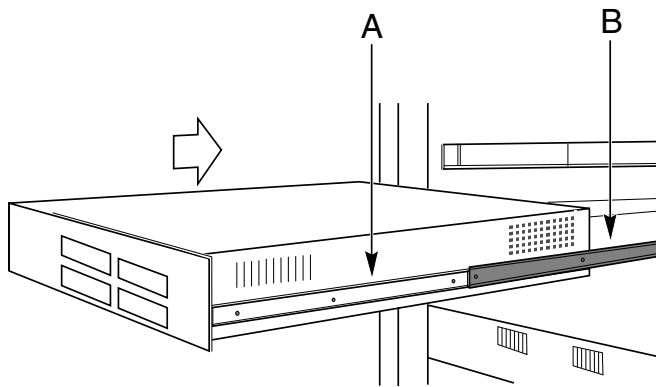


Figure: Step 9

With the chassis fully inserted into the cabinet rack, you can easily access both the front and rear of the system.

Connecting AC Power

Before connecting the server to a power source, proceed through the following checklist to assure that your server has been completely and correctly connected.

Installation Checklist

- ❖ Are all cables correctly and tightly connected and secured?
- ❖ Is the system power cord properly connected to the system and plugged into a NEMA 5-15R outlet for 100-120 V.
- ❖ Is AC power available at the wall outlet?
- ❖ Are the processors or processor termination board fully seated in their slots on the server board?
- ❖ Are all add-in PCI boards fully seated in their slots on the riser card?
- ❖ Are all switches and jumper settings on the server board set correctly?

- ❖ Are all jumper and switch settings on add-in boards and peripheral devices set correctly? To check these settings, refer to the manufacturer's documentation. If applicable, ensure that there are no conflicts. For example, two add-in boards sharing the same interrupt.
- ❖ Are all SDRAM DIMMs installed correctly?
- ❖ Are all peripheral devices installed correctly?
- ❖ Are all integrated components from the tested components lists? Check the tested memory, and chassis lists, as well as the supported hardware and operating system list on the Toshiba Customer Support Web site at <http://www.toshiba.support.com>.

Power Consumption Checklist

Before connecting the server to an AC outlet, make sure the power source has sufficient current capacity to satisfy the power requirements of the server system. If the system's power consumption exceeds the capacity of the power source, the server can be damaged.

- ❖ Always connect the server to a grounded AC outlet.
- ❖ Never connect the server to the same AC outlet as an appliance that has a high power consumption or that generates electrical noise, such as an air conditioner or photocopier.



HINT: Use a UPS to avoid losing data when an unexpected power failure occurs.

To connect the server to an AC power source:

- 1 Plug the power cable into the connector on the back of the server.
- 2 Plug the power cable into an AC outlet or, preferably, the power output connector of a UPS.



WARNING: Be sure to use the power cable supplied with the server. Using another power cable could create a fire hazard.

Turning on the Server



TECHNICAL NOTE: Always allow at least 10 seconds to elapse between turning the server off and turning it back on again. If the server is turned on before 10 seconds have elapsed, the server might malfunction.

- 1 Check that all the peripheral devices, such as the monitor, keyboard, and mouse, are properly connected to the server.
- 2 Check that all power cables are connected to grounded AC outlets or a UPS.
- 3 Turn on the monitor.
- 4 Press the power button.

The power indicator light is green.

Power-On Self Test (POST)

Pressing the power button turns on the server and starts the power-on self test (POST). The POST is a self-diagnosing function that automatically executes each time the server starts. The motherboard, microprocessor, memory, keyboard, and some peripheral devices connected to the server are automatically checked by the POST. During the memory test, the POST accesses and tests the server memory and then displays the amount of system memory on the screen.

Depending on how the server is configured, following the POST a message similar to the following appears on the screen:

Press F2 to enter SETUP

Pressing the F2 key starts the BIOS setup utility. If you don't press F2, system startup continues.

If the POST detects an error, depending on the error condition, one of the following events occurs:

- ❖ A buzzer sounds (beep code) during testing.
- ❖ An error code and message appear after the POST completes.

Booting the Server

You can boot the server from any of the following devices:

- ❖ Removable Devices (including Floppy Disk Drive)
- ❖ CD-ROM
- ❖ Hard disk drive (HDD)

Starting the Server From the Floppy Disk Drive

- 1 Make sure that the CD-ROM drive is empty.
- 2 Press the Power button to start the server.
- 3 Immediately after pressing the power button, place a bootable floppy into the floppy drive.

Starting the Server From the CD-ROM Drive

- 1 Make sure that the floppy disk drive is empty.
- 2 Press the Power button to start the server.
- 3 Immediately after pressing the Power button, place a bootable floppy into the floppy drive.

Starting the Server From the Hard Disk Drive

If the operating system is installed on the server, you can start the server from the hard disk drive. To start the server, check the floppy disk drive and the CD-ROM drive to make sure they are empty and then press the power button to start the server.



HINT: The eject button will only open the CD-ROM drive's disc tray when power is supplied to the server.

BIOS Setup

The server's system setup can be changed using the BIOS Setup utility. You can make changes to the BIOS Setup even if an operating system has not been installed on the server. The system settings you enter are written in the CMOS and flash memory and take effect when you restart the server. BIOS settings are used for reference during the POST.

If the server hardware doesn't support the values you enter, an appropriate error message appears on the screen when the POST routine is complete. If this occurs, change the setting using either the BIOS Setup Utility.

Turning Off the Server

The procedure for turning off the server depends on the operating system installed on the server. Always perform a normal shutdown when turning off the server.

Performing a Normal Shutdown

Turn off the server using the following method:

- 1 Shut down the operating system. For instructions, refer to the user's guide that came with your operating system.
- 2 Press the Power button to shut down the system.



TECHNICAL NOTE: If the server is turned on through the Wake On LAN function and turned off again before the Windows NT LAN driver is loaded, a startup fault may occur the next time you attempt to start the server using the Wake On LAN function. If this occurs, disconnect and then reconnect the power cable from the AC outlet.

Chapter 2

Connecting Hardware Devices

This chapter contains information and instructions on installing and removing optional devices.

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Installing Optional Devices

Before You Start

Before installing an optional device, read the manufacturer's instructions and the installation instructions in this manual. The procedures described in this chapter require specific technical knowledge and experience. If you have not installed or removed optional devices, or if the job seems difficult, consult an authorized Toshiba Magnia service provider. Toshiba assumes no liability for damages if you install and/or remove optional devices yourself.



DANGER: Some parts carry high voltages and are dangerous. To avoid electric shock, shut down the server and disconnect the power cable before performing any server maintenance.

Selecting a Workplace

Before performing server maintenance, select a workplace that is as free of dust as possible, and also consider the following:

- ❖ The ambient temperature and relative humidity should range between 50°F to 89°F (10°C to 32°C) and 30% to 80%. Avoid exposing the server to sharp temperature fluctuations that could cause condensation.
- ❖ Never install or remove devices in a static-inducing environment (on a carpet, for example). Electronic devices can fail if they are exposed to electrostatic discharge (ESD).

Working Safely



CAUTION: Internal server components can be seriously damaged by static electricity. Wear a wrist or heel ground cable to discharge static electricity carried on your body. If such equipment is not available, touch a grounded metal object to discharge static electricity before working on sensitive electronic components.

Once you remove a device from its antistatic package, if necessary, place the antistatic package and the device on a flat, grounded surface. Store the antistatic package for future use.

To prevent static build-up, never drag the server when moving it.

- ❖ Make sure you read and understand the instructions and precautions in this guide before performing server maintenance.
- ❖ Perform the steps in each procedure in the order written.
- ❖ Before disconnecting any cables, check their positions to make sure you reconnect them correctly.
- ❖ Check cable connectors for broken or bent pins. If a cable connector has screws, tighten the screws when securing the cable.
- ❖ If a failure occurs, consult your authorized Toshiba Magnia service provider.



WARNING: To avoid electric shock, never operate the server with the access cover removed.

Maintenance Overview



WARNING: Never disassemble the server more than described in this manual. Failure to observe this precaution could result in electric shock, cause a system fault, or void your warranty.

When performing maintenance on the server, follow these general steps:

- 1** Carefully read the precautions mentioned previously in this chapter. See [Installing Optional Devices](#) on page 49.
- 2** If the server is running, shut down the operating system, turn off all the peripheral devices connected to the server, then press and hold the Power Button to turn off the server. For more information, see [Turning Off the Server](#) on page 47.
- 3** Unplug the power cable from the AC outlet or UPS, then disconnect all signal cables connected to the I/O connectors on the back of the server.

- 4 Remove the server access cover. See [Removing the Access Cover](#) on page 53.
- 5 Perform the required maintenance.



CAUTION: Make sure that components handled during system maintenance are properly installed and connections are securely seated. Also check that no tools or hardware items are left inside the server.

- 6 Reinstall the server's access cover. See [Replacing the Access Cover](#) on page 54.
- 7 Reconnect all signal cables.
- 8 Press the Power Button to turn on the server, then run any required system checks.

Some optional devices require you to reconfigure the server's software, change jumper, and/or DIP switch settings before the device can be used.

In addition to the instructions in this chapter, refer to the manufacturer's user manuals for the devices you are installing/removing.

Working on Rack Mounted Servers

Read the following warnings before performing maintenance on a rack-mounted server. Failure to adhere to these warnings can result in serious injury and/or damage to equipment.

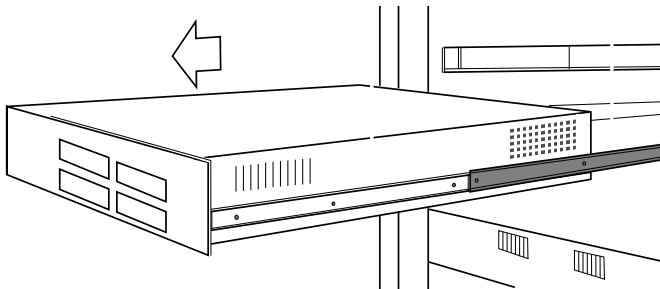
- ❖ Never attempt to install or remove a server by yourself. At least two people are required to install a server. Be particularly careful when installing a server near the top of a rack or in a location that requires you to lift the server higher than chest level.
- ❖ Never slide the server and another unit (such as an extension disk unit) out of the rack at the same time. Extending more than one device from the rack might cause it to become unstable.
- ❖ Never place additional weight or apply a continuous excessive load to a server or other unit that is extended from the rack. Such a load may damage the rack's rails or cause the rack to become unstable.
- ❖ Never lean objects against the rack and do not lean against it. The rack might become unstable and cause serious injury.
- ❖ When working at high locations around the rack, never lean ladders directly against the rack or against units installed in the rack. The installed units may be damaged, or the rack might become unstable and tip over, causing injury.

Sliding the Server From the Rack



CAUTION: If the rack contains additional servers that are currently in use, be careful not to touch the hard disk drive eject lever or AC switch on those servers.

- 1 Make sure that the cables connected to the server are long enough to allow the server to be extended from the rack. If the cables are too short, disconnect them to avoid damaging the cables or the server.
- 2 Loosen the two thumbscrews securing the server to the rack.
- 3 Grasp the handles on the server's front panel, then carefully slide the server from the rack.
- 4 Continue sliding the server from the rack until the rail latches lock the server in its fully-extended position.



Sliding the server from the rack

- 5 To ensure that the server is locked in position, using light pressure, try to slide the server back into the rack.

Sliding the Server into the Rack

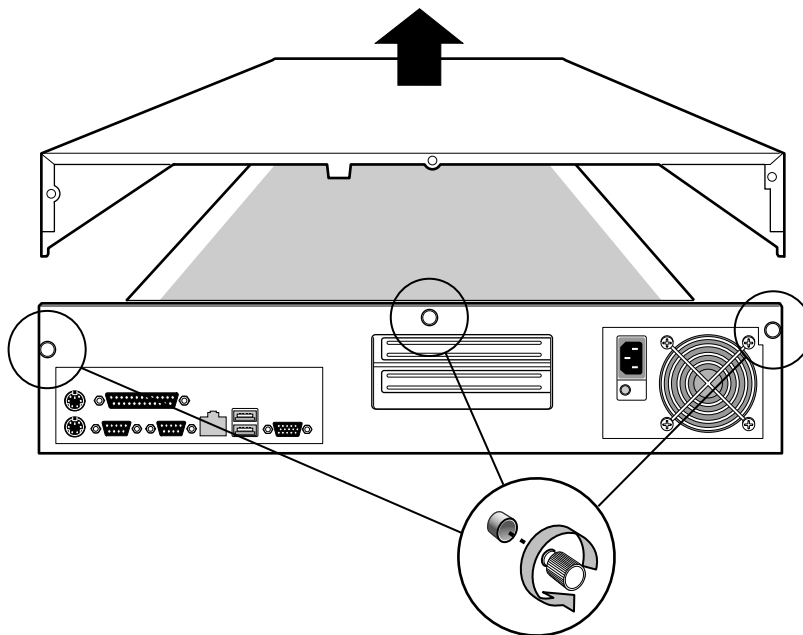
- 1 Press the rail latches inward to release the server from its locked position then slide the server into the rack.
- 2 Tighten the two thumbscrews on the front panel to secure the server to the rack.
- 3 Reconnect any cables that were disconnected from the server.

Removing and Replacing the Server Access Cover

This section provides instructions for removing and replacing the access cover on Toshiba Magnia 3135R servers.

Removing the Access Cover

- 1 If the server is powered on, shut down the operating system.
- 2 Press and hold the Power button to power-down the server.
- 3 Disconnect the server from the AC power source.
- 4 Unplug the display cable, keyboard cable, and any other peripheral device cables connected to the server.
- 5 Loosen the two thumbscrews securing the server to the rack.
- 6 Grasp the handles on both sides of the server and slowly pull the server from the rack. Latches on both rack rails stop the server when it reaches its fully extended position. Make sure the latches lock, preventing the server from sliding back.
- 7 Loosen the three thumb-screws on the rear of the system.
- 8 Pull the cover back and remove it from the chassis.



Removing cover thumb-screws on back of server

Replacing the Access Cover

- 1 Position the access cover on the server carefully so that it does not pinch any internal cables then slide the panel toward the front of the server.
- 2 Tighten the three screws on the rear of the chassis.
- 3 Press the latches on the rails to release the server from its extended position then slide the server into the rack.



WARNING: To avoid injury, when sliding the server into the rack, be careful not to catch your fingers in the rails.

- 4 Tighten the two thumbscrews to secure the server to the rack.
- 5 Connect the display and keyboard cables, and any other peripheral device cables, that you disconnected.
- 6 Connect the server to an AC power source.

Cooling Fans

To regulate the temperature inside the server, the Toshiba Magnia 3135R is equipped with the following cooling fans:

- ❖ Two 80mm system fans mounted in the middle of the chassis
- ❖ Power Supply fan internal to the power supply
- ❖ One CPU fan mounted on each processor

Removing and Replacing a System Fan

This section provides instructions for removing and replacing a system fan in a Toshiba Magnia 3135R server.

Removing a System Fan

- 1 If the server is in operation, shut it down and remove the access cover. For instructions on all three tasks, see Removing the Access Cover in [Maintenance Overview](#) on page 50.



DANGER: Removing a cooling fan while the server is on could result in electric shock, and shorten the service life of the fan and the server.

- 2 Unplug the two fan cables from the server board. The cable for fan #1 goes to connector FAN2A, and the cable for fan #2 goes to FAN3A.
- 3 Press the tabs on both sides of the inoperative fan and lift it out of the fan assembly.

Replacing a System Fan

- 1 Insert the new fan into the fan assembly, making sure that the flow and rotation arrows on the fan point correctly.
- 2 Plug the fan cables back into the connectors on the server board.
- 3 Reinstall the access cover, reconnect all signal and power cables, then turn on the server. For instructions, read [Maintenance Overview](#) on page 50.

Memory Modules

The server contains four memory module slots. Memory is partitioned as four banks of SDRAM DIMMs with each bank providing 72 bits of non-interleaved memory (64-bit main memory plus ECC).

Memory is expandable from 128 MB to 4 GB using registered Dual In-line Memory Modules. You can install one SDRAM DIMM with Error-Correcting Control (ECC) in each slot. System memory is available in 128 MB, 256 MB, 512 MB, and 1 GB modules.



CAUTION: If you are unsure about removing, replacing, or expanding memory, call your authorized Toshiba Service Representative. Using the wrong memory module, or the wrong combination of modules could result in damage to equipment.

Memory Expansion Considerations

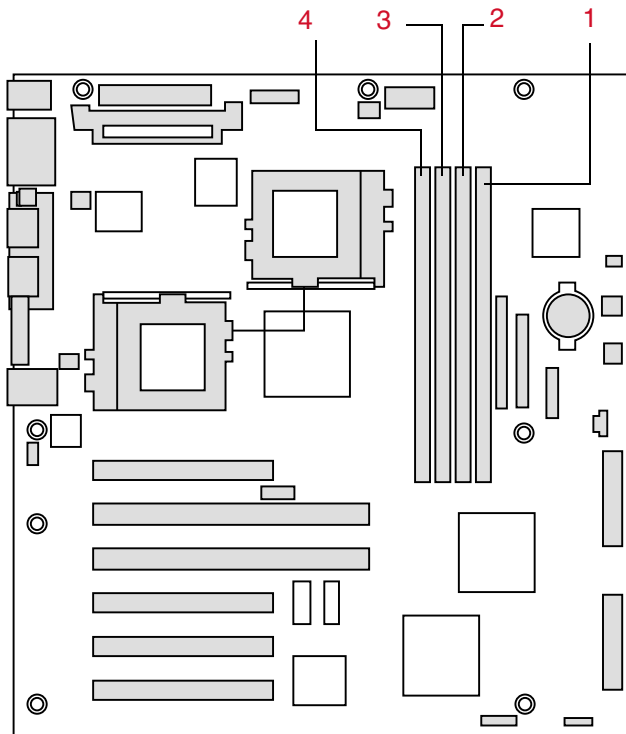
The server only supports Registered ECC PC/133-compliant SDRAM.

Slot 1	Slot 2	Slot 3	Slot 4	Total Capacity
1024	1024	1024	1024	4096
512	1024	1024	1024	3584
256	1024	1024	1024	3328
128	1024	1024	1024	3200
1024	1024	1024	-	3072
512	512	1024	1024	3072
512	1024	1024	-	2560
512	512	512	1024	2560
256	256	1024	1024	2560
256	1024	1024	-	2304
128	128	1024	1024	2304
128	1024	1024	-	2176
1024	1024	-	-	2048
512	512	1024	-	2048
512	512	512	512	2048
256	512	512	512	1792
256	256	256	1024	1792
128	512	512	512	1664
512	1042	-	-	1536
512	512	512	-	1536
256	256	1024	-	1536
256	256	512	512	1536

Slot 1	Slot 2	Slot 3	Slot 4	Total Capacity
128	128	128	1024	1408
256	1024	-	-	1280
256	512	512	-	1280
256	256	256	512	1280
128	128	1024	-	1280
128	128	512	512	1280
128	512	512	-	1152
128	1024	-	-	1152
1024	-	-	-	1024
512	512	-	-	1024
256	256	512	-	1024
256	256	256	256	1024
128	256	256	256	896
128	128	128	512	896
128	128	256	256	768
128	128	512	-	768
256	256	256	-	768
256	512	-	-	768
128	128	128	256	640
128	256	256	-	640
128	512	-	-	640
512	-	-	-	512
256	256	-	-	512
128	128	256	-	512
128	128	128	128	512
128	128	128	-	384
128	256	-	-	384
256	-	-	-	256
128	128	-	-	256
128	-	-	-	128

Installing Memory Modules

When upgrading system memory, place the first memory module in the lowest numbered memory slot of slots 1 through 4. If the memory modules are of different capacities, place them in order of increasing capacity, installing the memory module with the smallest capacity in slot 1.



Memory slots



WARNING: Never perform disassembly procedures that are not described in this manual. Never install or remove memory modules immediately after turning off the server. To avoid burn injuries, wait for the heat around the memory modules to dissipate.

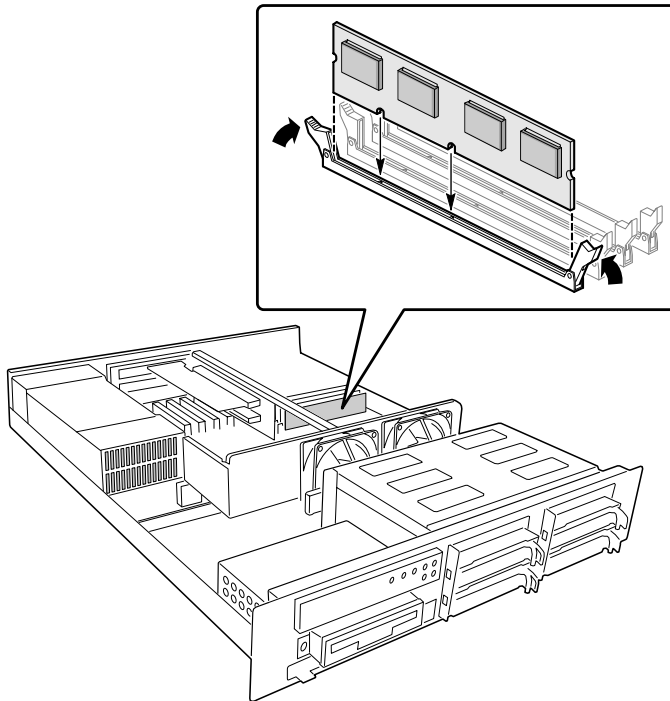


CAUTION: Installing a memory module while the server is on could cause damage to the server or the memory module.

Memory modules can be seriously damaged by static electricity. Wear a wrist or heel ground cable to discharge static electricity carried on your body. If such equipment is not available, touch a grounded metal object to discharge static electricity before working with sensitive electronic components.

Mixing dissimilar metals may cause later memory failures resulting in data corruption. Install DIMMs with gold-plated edge connectors in gold-plated sockets only.

- 1 If the server is in operation, shut it down and remove the access cover. For instructions, see [Removing the Access Cover](#) on page 53.
- 2 Holding the DIMM by its edges only, remove it from its anti-static package.
- 3 Orient the DIMM so that the two notches on the bottom edge align with the keyed socket.



Installing memory modules

- 4 Insert the bottom edge of the DIMM into the socket and press down firmly on the DIMM until it seats correctly.
- 5 Gently push the plastic ejector levers on the socket ends to the upright position.
- 6 Repeat steps 2 through 5 to install each DIMM.
- 7 Ensure that no cables are protruding from the server chassis and then replace the server cover.
- 8 Connect all external cables and the power cord to the server.
- 9 Turn on the monitor and then the server.

Removing a Memory Module

- 1 If the server is in operation, shut it down then remove the access cover. For detailed instructions, read the [Maintenance Overview](#) on page 50.



CAUTION: Removing a memory module while the server is on could cause damage to the server or the memory module.

Memory modules can be seriously damaged by static electricity. Wear a wrist or heel ground cable to discharge static electricity carried on your body. If such equipment is not available, touch a grounded metal object to discharge static electricity before working on sensitive electronic components.

Mixing dissimilar metals may cause memory failures resulting in data corruption. Install DIMMs with gold-plated edge connectors in gold-plated sockets only.

- 2 Observe the safety and ESD precautions discussed earlier in this chapter.
- 3 Remove the server cover.
- 4 Gently push the plastic ejector lever out and down to eject a DIMM from its socket.
- 5 Hold the DIMM by its edges, being careful not to touch its components or gold edge connectors. Carefully lift it away from the socket and store it in an antistatic package.
- 6 Repeat steps 4 and 5 to remove additional DIMMs as necessary.
- 7 Replace the server cover.
- 8 Connect all external cables and the power cord to the server.
- 9 Turn on the monitor and then the server.

CPU Modules

The Toshiba Magnia 3135R server supports dual-CPU configurations allowing you to install an additional processor to increase system performance.

The base Toshiba Magnia 3135R server is configured with a single CPU module with a specified frequency (clock speed) and cache size. If you are upgrading your server to a dual-CPU configuration, you must install CPU modules with the same speed, cache size, and connector technology.

The server supports up to two Intel® Pentium III processors (with 133 MHz system bus). If you are installing two processors, make sure they are the same speed, voltage, and stepping.

Installing a Second Processor



WARNING: Never disassemble the server beyond what is described in this manual. Failure to observe this precaution could result in electric shock, cause a system fault, or void your warranty.

Never install or remove CPU modules immediately after turning off the server. To avoid burn injuries, wait for the heat around the CPU modules to dissipate.



CAUTION: Be sure your server is compatible with a newer, faster processor. If you are adding a second processor, be sure it is compatible with the first processor.

- 1 If the server is in operation, shut it down then remove the access cover. For detailed instructions, refer to the [Maintenance Overview](#) on page 50.



CAUTION: Installing a CPU module while the server is ON could cause damage to the server or the CPU module.

CPU modules can be seriously damaged by static electricity. Wear a wrist or heel ground cable to discharge static electricity carried on your body. If such equipment is not available, touch a grounded metal object to discharge static electricity before working with sensitive electronic components.

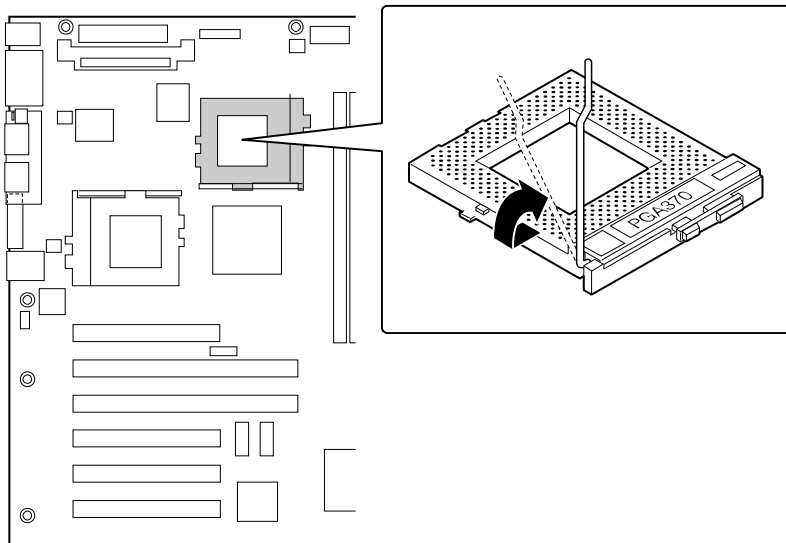
- 2 Observe the safety and ESD precautions at the beginning of this chapter and the additional cautions given here.

- 3 Remove the new processor from its anti-static package and place it on a grounded, static-free surface or conductive foam pad.



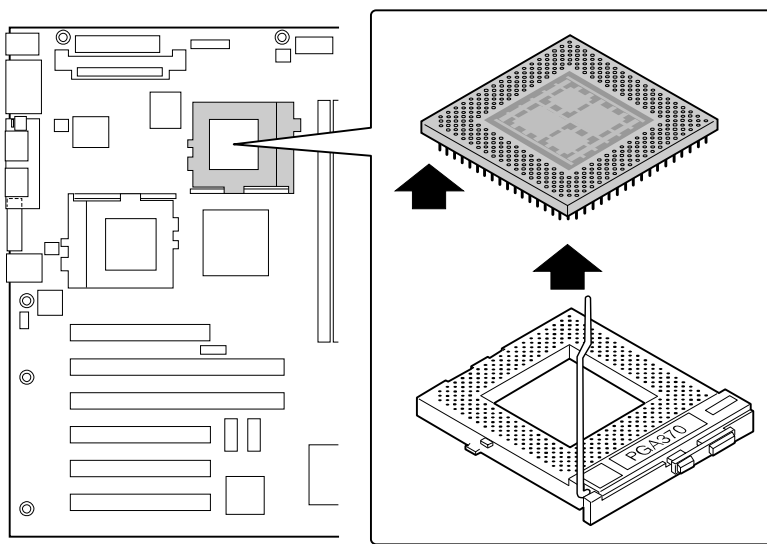
HINT: Servers shipped with a single CPU module have a termination module installed in the secondary CPU slot.

- 4 Raise the socket locking lever.



Raise the locking lever

- 5 Remove the terminator.

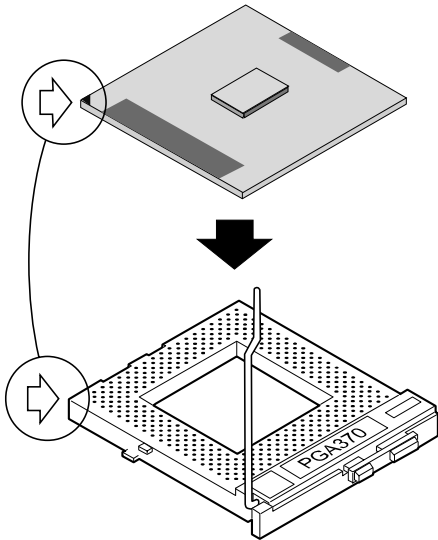


Removing the terminator

- 6 Align the processor pins with the socket. Be sure to note the processor speed so you can correctly set the jumpers.

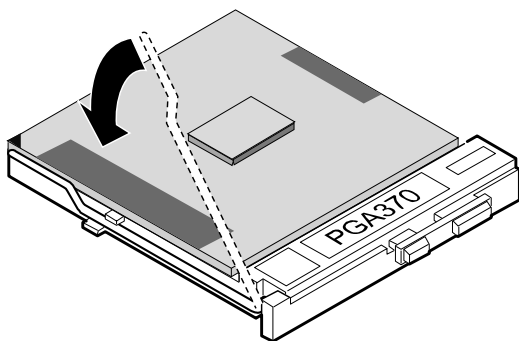


CAUTION: Do not force the CPU into the socket or it can be damaged.



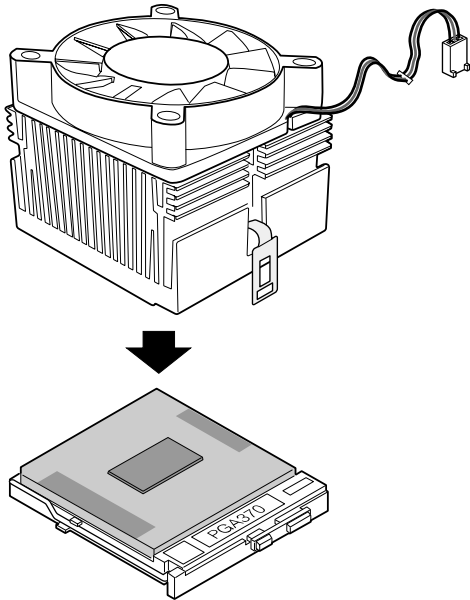
Inserting the processor

- 7 Lower the locking lever to the locked position.



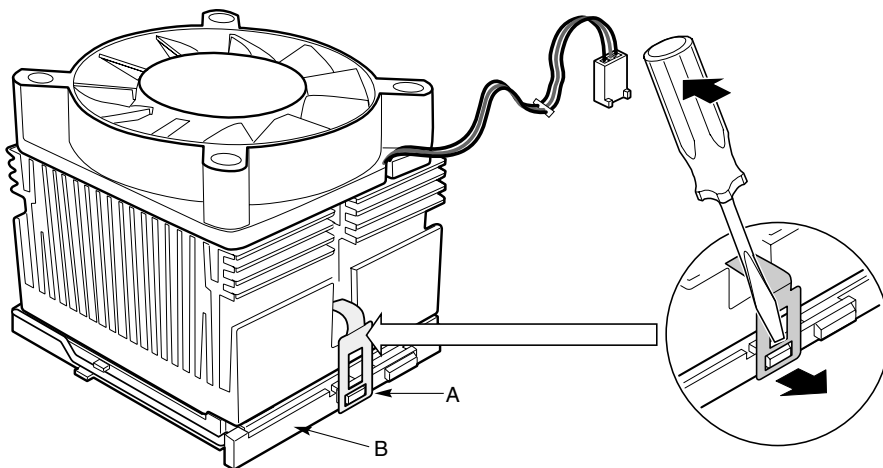
Lowering the locking lever

- 8** Remove the thermal grease protection cover from the heat sink, and place the fan heat sink on top of the processor.



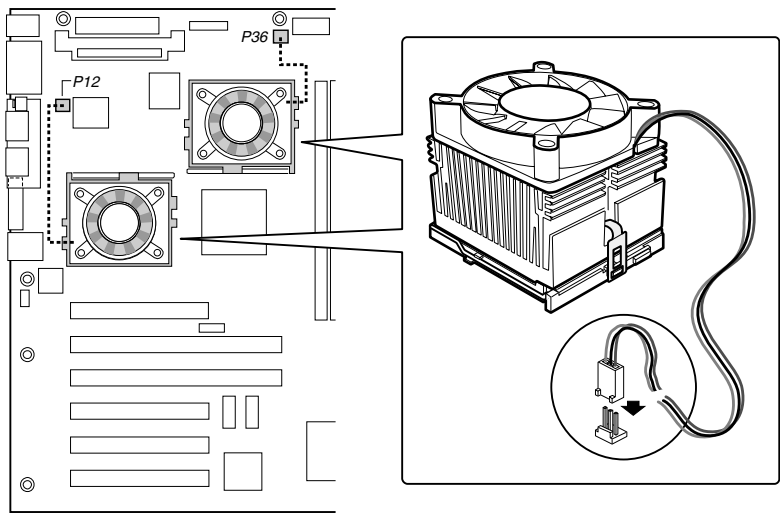
Placing the heatsink

- 9** Attach the fan heat sink clip to the processor socket. Attach the side away from the fan cable first, and using a screw driver, attach the remaining side.



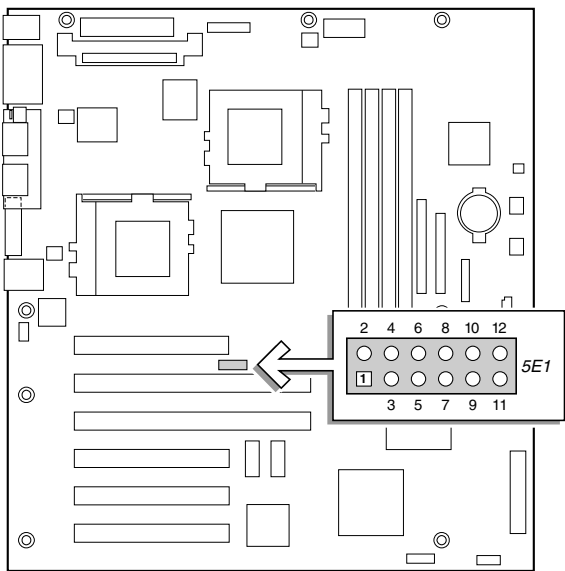
Attaching the heatsink

10 Connect the processor fan cable.



Connecting the processor fan

11 Configure the speed jumpers.



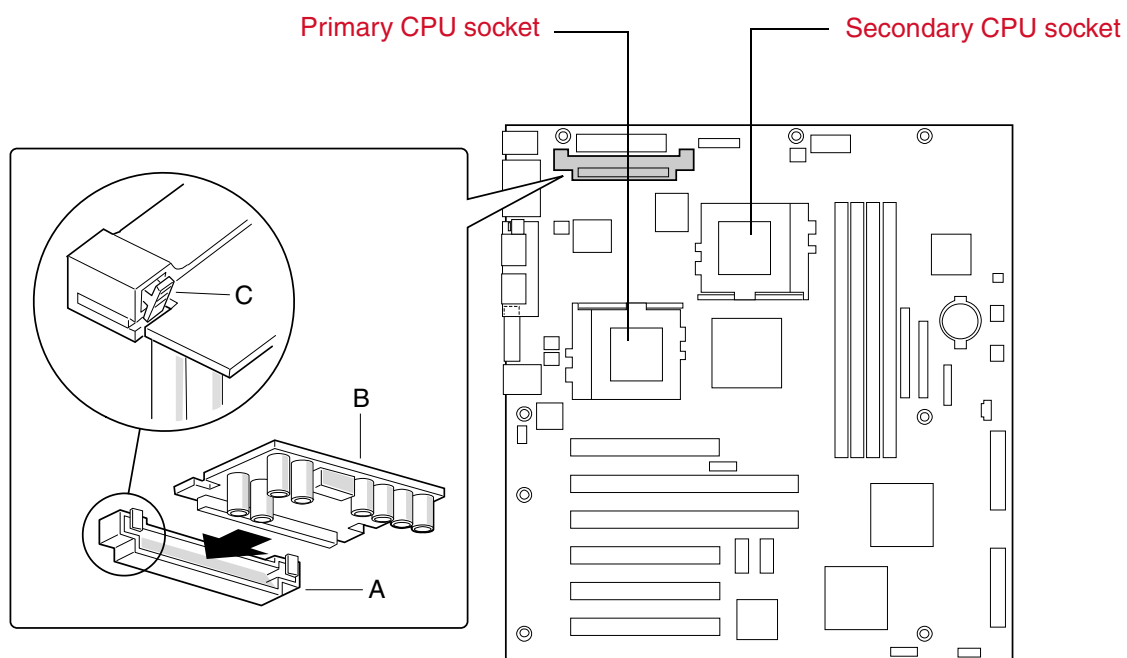
Processor clock speed jumpers

CPU Speed	Pins 1-2	Pins 3-4	Pins 5-6	Pins 7-8	Pins 9-10	Pins 11-12
733			X			
866	X	X				
1000	X					



CAUTION: If you install only one processor in a system, it must go into the primary connector (closest to the PCI slots). With a single-processor configuration, you must install a termination board and termination latch assembly in the empty secondary connector to ensure proper operation of your system. A termination board is provided with your system.

- 12** If you are installing two processors, you must install a voltage regulator module (VRM) as shown below, and secure it with the locking tabs.



Installing a VRM

- 13** Reinstall the access cover, reconnect all signal and power cables.
- 14** Press the Power button to turn on the server.

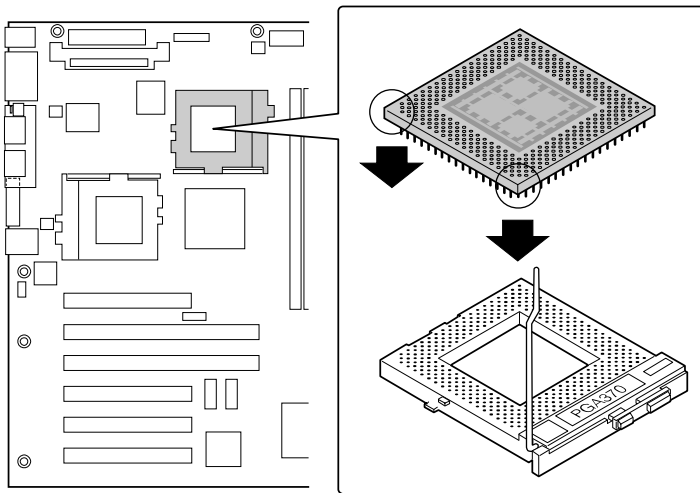


TECHNICAL NOTE: If the server is running Windows NT, you may need to reinstall and/or configure Windows NT to support a dual-processor configuration. For more information, refer to your operating system documentation.

CPU modules with different cache sizes or clock speeds cannot be used together. When you add a CPU module, make sure that it is the same speed as the existing CPU module.

Removing a Processor

- 1 Observe the safety and ESD precautions at the beginning of this chapter and the additional cautions given here. If the processor has a fan heat sink, disconnect the power wire from the connector on the server board.
- 2 As you work, place boards and processors on a grounded, static free surface or conductive foam pad.
- 3 Unplug the heat sink fan.
- 4 Detach the heat sink clip and remove the heatsink from the processor.
- 5 Raise the socket locking lever and remove the processor.
- 6 Place the processor in a piece of conductive foam and store in an anti-static package.
- 7 Replace the terminator.

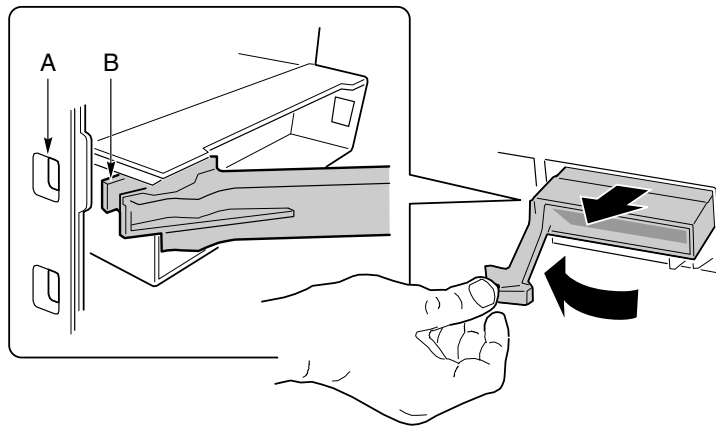


Replacing the terminator

Installing Hard Drives

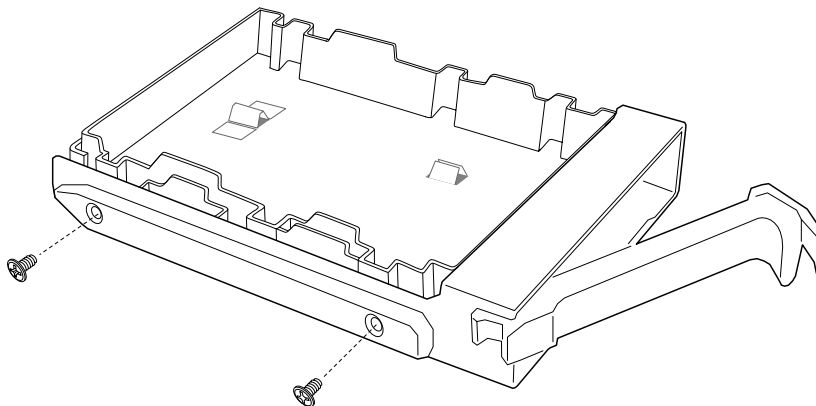
The Magnia 3135R server has four hot-swappable hard drive bays. Your server may or may not include a hard drive depending upon your purchase options. An initial, or additional hard drive may be added using the following steps.

- 1 Remove the drive carrier(s) from the drive bays by unclipping the retention lever on the right side of the handle (Step 1 below). Pull the retention lever toward you until the tab end (B) of the lever is free of the housing slot (A). Pull the drive carrier forward and out of the housing.



Step 1: Removing the hard drive carrier from the chassis

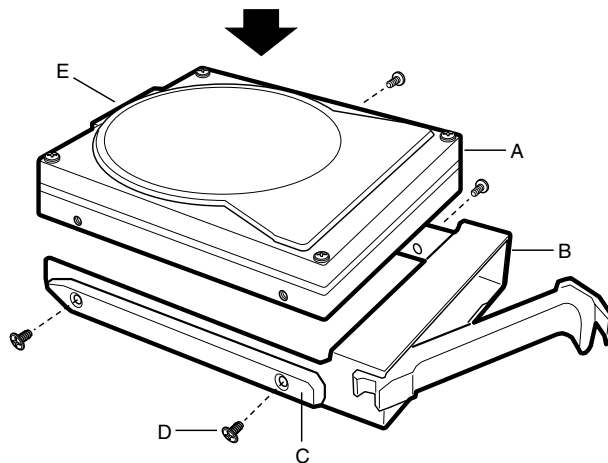
- 2 Release the air baffle (B) by removing the four screws (A) from the drive carrier/drive slide track.



Step 2: Removing the air baffles

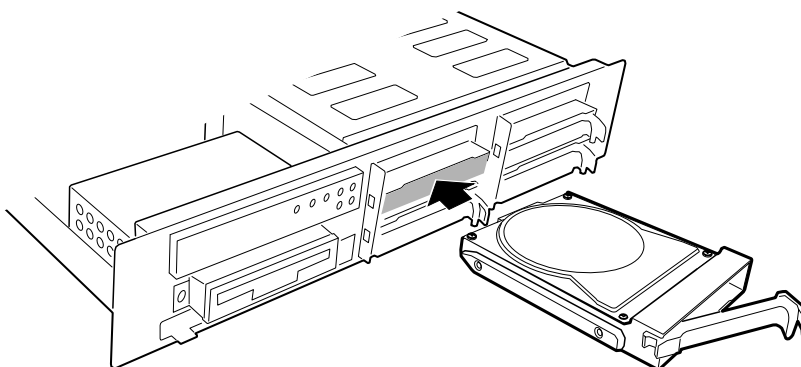
- 3 Remove the hard drive from its protective wrapper and place it on an anti-static surface.

- 4 Set any jumpers and/or switches on the drive according to the drive manufacturer's instructions.
- 5 Align the drive holes (Step 5) to the holes in the drive carrier slide track (C), insert the screws that you previously removed (Step 2), and attach the carrier (B) to the drive (A). Make sure that the connector end of the drive (E) is facing the back of the carrier and the drive top is facing upward before inserting the screws.



Step 5: Attaching the drive to the carrier

- 6 Slide the carrier/drive into the server chassis with the retention mechanism extended in the open position, then push the arm toward the front of the chassis until the lever tab clicks and the chassis slot indicating that it is closed.



Step 6: Inserting the carrier/drive into the drive bays

Internal Battery

The lithium battery on the server board powers the real time clock (RTC) for up to 10 years in the absence of power. When the battery starts to weaken, it loses voltage, and

the server settings stored in CMOS RAM in the RTC (for example, the date and time) might be wrong. Contact your customer service representative or dealer for a list of approved devices.



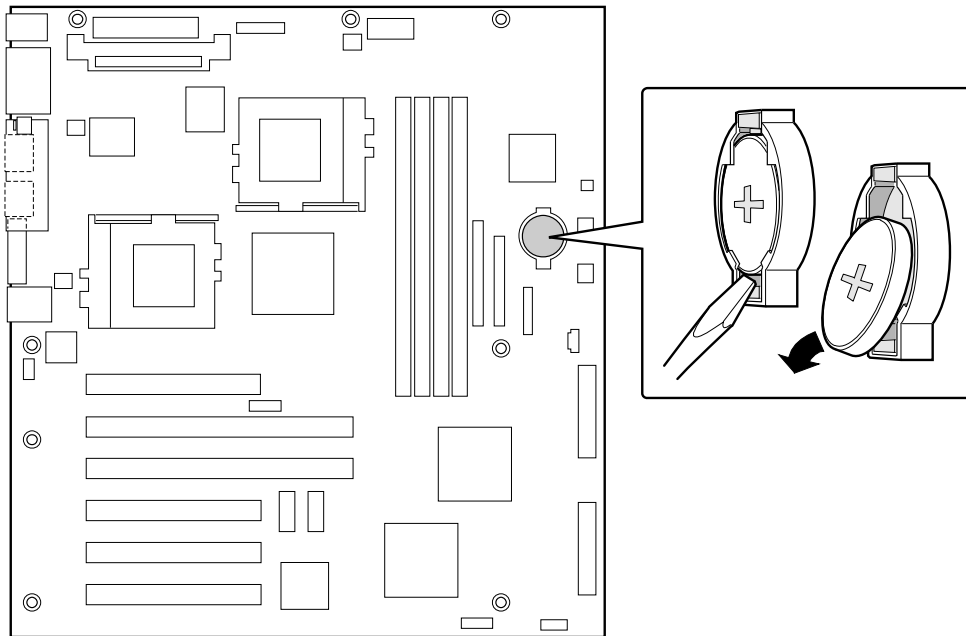
WARNING: The danger of explosion exists if battery is incorrectly replaced. Replace only with the same or equivalent type of battery recommended by the equipment manufacturer. Discard used batteries according to the battery manufacturer's instructions.

Observe the following guidelines when replacing the battery:

- ❖ Do not charge, disassemble, or remove the battery electrode.
- ❖ Do not incinerate the battery or expose it to excessive heat.
- ❖ Store the battery in a cool dry place.
- ❖ When disposing of the battery, adhere to company policy and local government rules and regulations.
- ❖ Fit the battery with the electrodes (+/-) correctly oriented. Otherwise you risk causing heat, an explosion, or a fire.
- ❖ To ensure proper system operation, replace the battery with one of the same type.

Replacing the Internal Battery

- 1 Observe the safety and ESD precautions at the beginning of this chapter, and the additional cautions given here.
- 2 Remove the server access cover.
- 3 Insert the tip of a small flat bladed screwdriver, or equivalent, under the tab in the plastic retainer.
- 4 Gently push down on the screwdriver to lift the battery.
- 5 Remove the battery from its socket.
- 6 Dispose of the battery according to local ordinance.
- 7 Remove the new lithium battery from its package and, being careful to observe the correct polarity, insert it in the battery socket



Removing the battery

- 8 Reinstall the plastic retainer on the battery socket.
- 9 Reinstall any expansion cards you removed.
- 10 Reinstall the access cover, reconnect all signal and power cables, then turn on the server. For instructions, read the [Maintenance Overview](#) on page 50.

Peripheral Devices

The Toshiba Magnia 3135R server is delivered with a Floppy Diskette Drive and a CD-ROM Drive installed in the front section of the server.

Floppy Diskette Drive (FDD)

Removing the Diskette Drive

- 1 Observe the safety and ESD precautions at the beginning of this chapter.
- 2 Disconnect the power and signal cables from the diskette drive. The connectors are keyed for ease in reconnecting them to the drive.
- 3 Remove and save the screws that secure the diskette drive carrier to the front of the chassis.
- 4 Slide the drive carrier out the front of the chassis.
- 5 Remove and save the screws from the sides of the drive carrier.
- 6 Pull the drive out of the carrier and place the drive in an anti-static protective wrapper if you are not reinstalling it.

Reinstalling the Diskette Drive

- 1 Remove the new 3.5-inch diskette drive from its protective wrapper and place it component-side up on an anti-static surface.
- 2 Install the drive into the drive carrier and secure it with the screws that you removed.
- 3 Slide the drive carrier through the front of the chassis.
- 4 Secure the drive carrier to the front of the chassis with the screws you removed earlier.
- 5 Connect the signal and power cables to the drive according to the manufacturer's specifications.

Removing and Replacing the CD-ROM Drive

Removing a CD-ROM Drive

- 1** Remove the diskette drive housing as outlined in "Removing the Diskette Drive."
- 2** Remove the three screws holding the drive to the chassis.
- 3** Disconnect the power and data cables from the drive.
- 4** Slide the drive tray out of the front of the chassis.
- 5** Remove the CD-ROM from the CD-ROM tray.
- 6** If you are not re-installing the same drive, place the drive in an anti-static protective wrapper.
- 7** Re-install the diskette drive housing as outlined in "Installing the Diskette Drive."

Replacing a CD-ROM Drive

- 1** Remove the new CD-ROM drive from its protective wrapper and place it on an anti-static surface.
- 2** Set any jumpers and/or switches on the drive according to the drive manufacturer's instructions.
- 3** Attach the CD-ROM drive to the CD-ROM tray using the mounting screws supplied with the system.
- 4** Slide the slim-line CD-ROM tray into the CD-ROM bay.
- 5** Connect the CD-ROM IDE cable and power cables to the connector at the back of the CD tray.
- 6** Reinstall the diskette drive as outlined in the section "Re-Installing the Diskette Drive."
- 7** Insert the recessed retention screws through the access holes in the top of the drive bay housing.
- 8** Insert the retention screw on the front of the chassis.

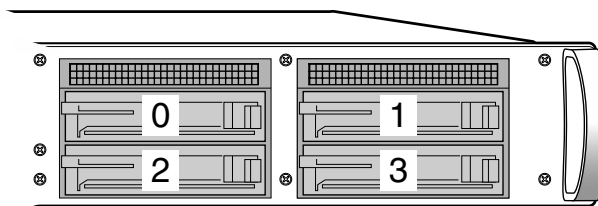
Small Computer Systems Interface (SCSI)

Internal Hard Disk Drives (HDD)

The Toshiba Magnia 3135R has four SCSI HDD bays.

Each internal bay is assigned a unique SCSI address starting with Bay 1 (SCSI ID=0) for the top bay in the drive cage.

For example:



- ❖ Bay 1 = SCSI ID 0
- ❖ Bay 2 = SCSI ID 1
- ❖ Bay 3 = SCSI ID 2
- ❖ Bay 4 = SCSI ID 3

When adding a hard disk drive to the server, always position the drive(s) sequentially, beginning with the first vacant drive bay with the lowest available SCSI ID.

Detecting the SCSI Device (SAF-TE)

SAF-TE communicates its status to a software agent resident in the server through a SCSI bus, and then sends out an appropriate notification. This notification includes:

- ❖ Presence of a device
- ❖ Status of a device bay slot



DEFINITION: SAF-TE (SCSI Accessed Fault Tolerant Enclosure) is a standardized alert detection and status reporting system using SCSI as the underlying transport mechanism.

Terminating SCSI Devices

The SCSI bus is terminated on the server board with active terminators that cannot be disabled. The onboard device must always be at one end of the bus.



TECHNICAL NOTE: Make sure to route the SCSI cable so that it does not come in contact with the fan assembly.

The device at the end of the cable must be terminated. LVDS devices generally do not have termination capabilities. Non-LVDS devices generally are terminated through a jumper or resistor pack. If your device does not have a termination jumper or resistor pack, you must add a terminator to the end of the cable.

The hot-swap backplane in the Magnia 3135R system provides termination for the LVD SCSI bus.

Downgraded Server Operation

If your server is equipped with a RAID controller for data redundancy and one of the hard disk drives in the array fails, the system will go into a "downgraded operational state" and continue to run. If, in addition, the server has a specified spare hard disk drive (hot spare) in reserve, the server can run in a "downgraded operational state" with up to two failed hard disk drives.

The MegaRAID® controller installed in Toshiba Magnia 3135R servers supports the following standard RAID levels:

- ❖ RAID 0 (Striping)
- ❖ RAID 1 (Disk Mirroring)
- ❖ RAID 5 (Disk Striping with Distributed Parity)
- ❖ RAID 10 (Mirroring and Disk Striping)

RAID 0 - Disk Striping

Striping, also referred to as a Stripe set, chains multiple drives into a single logical storage unit. Striping partitions each drive's storage space into stripes, or data chunks, may be as small as one sector (512 bytes) or as large as several megabytes. The stripes are interleaved so that the combined storage space of the array comprises alternate stripes from each hard disk drive. The end result is an even distribution of storage space across the entire set of drives in the array.

The type of operating system installed on the server determines whether large or small stripes are used in the array. Although disk striping fully utilizes I/O system capability and improves overall disk performance, **it does not provide for data redundancy.**

RAID 1 - Disk Mirroring

Data written to one hard disk drive is simultaneously written to another hard disk drive. If one disk fails, the other disk can be used to run the system and reconstruct the failed disk. Since the disk is mirrored, it does not matter if one of them fails because both disks contain the same data at all times. Either disk can act as the operational disk. This level provides 100% redundancy because each drive in the system is duplicated. This type of array is used for read-intensive, fault tolerant required configurations. Two or more disks are required to configure this type of RAID level.

RAID 5 - Disk Striping With Distributed Parity

Uses parity to generate redundancy data from two or more parent data sets. Parity storage is rotated or distributed through the stripe of the disk array. Parity storage provides an advantage for applications that require high read-request rates with low write-request rates such as transaction processing, office automation, and online customer service because parity generation can slow down write operations considerably. Three or more disks are required to configure this type of RAID level.

To enable automatic recovery of a faulty disk array, you must specify the spare device in the RAID configuration. If a drive fails, the RAID controller will automatically initiate a recovery sequence, bringing the spare device into service. For more information, refer to the user's guide that came with your RAID controller.

RAID 10 - Disk Striping and Disk Mirroring

RAID 10 is a combination of RAID 0 and RAID 1. RAID 10 has mirrored drives. RAID 10 breaks up data into smaller blocks, and then stripes the blocks of data to each RAID 1 raid set. Each RAID 1 raid set duplicates its data to its other drive. The size of each block is determined by the stripe size parameter, which is set during the creation of the RAID set. RAID 10 can sustain one to four drive failures while maintaining data integrity, if each failed disk is in a different RAID 1 array.

RAID 10 works best for data storage that must have 100% redundancy of mirrored arrays, and that also needs the enhanced I/O performance of RAID 0 (striped arrays).

RAID 10 works well for medium-sized databases or any environment that requires a higher degree of fault tolerance and moderate-to-medium capacity. RAID 10 provides both high data transfer rates and complex data redundancy. RAID 10 requires twice as many drives as all other RAID levels except RAID 1 (Minimum number of drives is 4: 2 Disk Striping and Mirroring).

RAID Failures

This section describes how the RAID configuration responds when a component failure occurs.

The number of hard disk drives that can fail without affecting system operation depends on the RAID configuration of your server. If a hard disk drive fails, replace it as quickly as possible and rebuild the disk array.

Striping Configuration Failure (RAID 0)

A striping hard disk drive fault represents a critical RAID failure. To recover from a striping failure, replace the failed drive, then completely rebuild the RAID array, and restore the data from backup.

Mirrored Drive RAID Configuration Failure (RAID 1)

When a hard disk drive fails in a mirrored array, the system takes the sub-mirror the drive is a part of, off-line. The system routes all data access to the remaining sub-mirror until the failed drive is either hot-swapped or repaired. The performance of a degraded mirrored RAID 1 is equal to the performance rendered by the remaining hard disk drive.

Parity RAID Configuration Failure (RAID 5)

The data in a RAID 5 array is kept in an *encoded format* and distributed across the number of independent drives in the array. Consequently, write operations on a parity RAID array are slightly slower. This is true even if the parity RAID is functioning normally. When a hard disk drive in a parity RAID fails, every other hard disk drive in the array is needed to recover the failed hard disk drives data and to complete the repair operation.



TECHNICAL NOTE: If your server is equipped with a RAID controller, but Power Console (Windows NT) and MegaRAID Manager (NetWare) are not installed, you can replace a faulty hard disk drive while the server is running, but you won't be able to recover (rebuild) the disk array.

If the Server Does Not Have a RAID Controller

If the server is not configured with a RAID controller, the status indicator of each hard disk drive will not be able to display which drive is faulty.

The server's four hard disk drive bays are hot-swappable, allowing you to remove any drive while the server is running. However, removing a critical system drive or a data drive that is routinely accessed by system applications and/or users may cause a severe system failure if the drive is removed while the server is running.

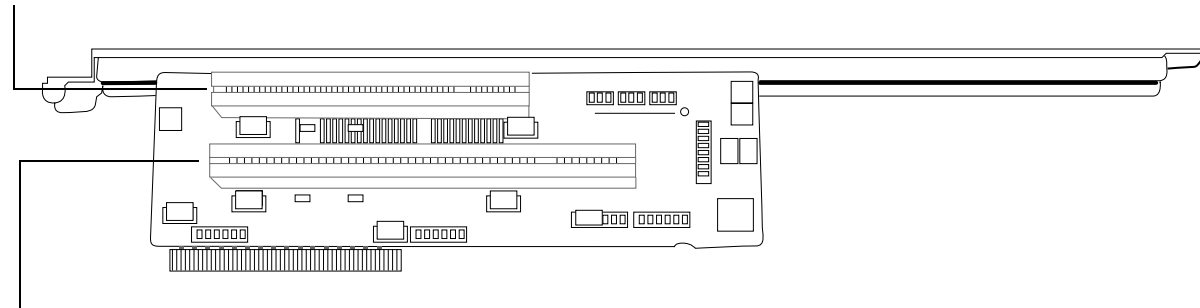


CAUTION: Use extreme caution when removing a hard disk drive. To avoid a severe system failure, while the server is running never attempt to replace a critical system drive (i.e., the drive with on which the Windows NT Partition is stored) or data drive that is routinely accessed by system applications and/or users.

Expansion Cards

You can only add two PCI cards to the Magnia 3135R, which are located on a riser card installed in slots 5 and 6 of the main board. **Do not use any expansion slots on the server board.**

32-bit PCI slot



64-bit PCI slot

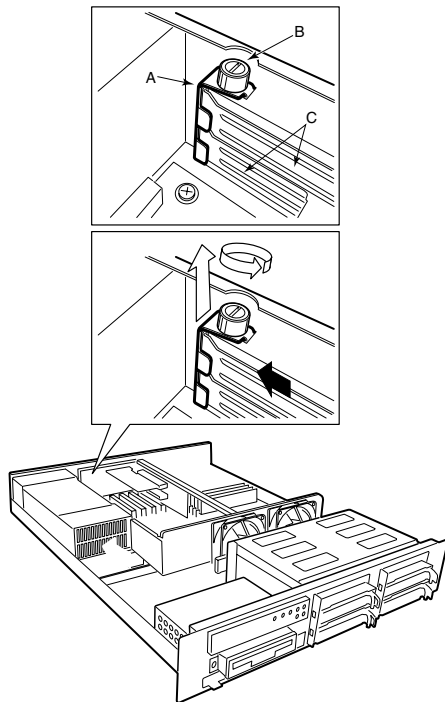
Riser card with 2 expansion slots

Restrictions on PCI Expansion Cards

In some cases, a memory module cannot be replaced due to interference with an optional card installed in a PCI slot. When this happens, remove the optional card, then replace the memory module.

Installing Add-in Cards

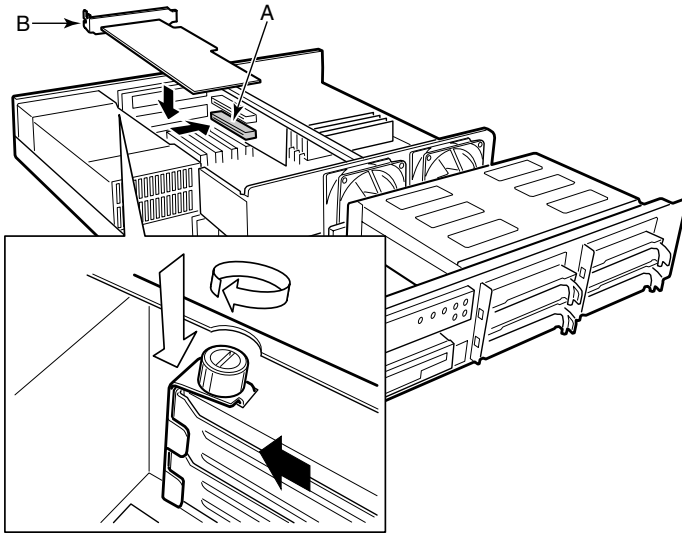
- 1 Remove the expansion slot cover for the slot you wish to use by removing the thumbscrew (B) holding the cover retention bracket (A) to the chassis.
- 2 Remove the bracket from the chassis.



Step 1: Removing the expansion slot cover

- 3 Remove the expansion slot cover (C in Step 1) for the slot you wish to use.
- 4 Remove the add-in board from its protective wrapper. Set jumpers or switches according to the manufacturer's instructions.
- 5 Hold the board by its top edge or upper corners. Firmly press it into an open expansion slot on the riser board. The tapered foot of the board-retaining bracket must fit into the mating slot in the expansion slot frame. Install the board component side DOWN.

- 6** Align the rounded notch in the retaining bracket (B in Step 5) with the threaded hole in the frame. The bracket fits the space that was occupied by the slot cover.



Step 5: Installing the add-in card

- 7** Install the cover retention bracket and thumbscrew.

Installing a RAID Controller

- 1 If the server is in operation, shut it down then remove the access cover. For detailed instructions, read the [Maintenance Overview](#) on page 50.



CAUTION: Installing the RAID controller while the power is on may damage the server and the RAID controller.

- 2 Disconnect the SCSI cable from the motherboard.



CAUTION: To avoid damaging the SCSI cable, grasp the cable connector when disconnecting the cable.

- 3 Lift the card support on the bottom PCI slot and remove the expansion slot cover.
- 4 Connect the SCSI cable to the SCSI connector on the RAID controller and connect the SCSI cable to channel 1 when installing a RAID card that has two internal hard disk drive connectors. For more information, refer to the user's guide that came with the RAID controller.
- 5 Reinstall the access cover, reconnect all signal and power cables, then turn on the server. For instructions, read the [Maintenance Overview](#) on page 50.
- 6 Install the configuration software for the RAID card, then set up the disk array (RAID). For instructions, refer to the user's guide that came with the RAID controller.

Chapter 3

System Configuration Setup

This chapter describes the Power-On Self Test (POST) and server configuration utilities. The table below describes each of the utilities.

Utility	Description and brief procedure	Page
BIOS Setup	If the system does not have a diskette drive, or if the drive is disabled or misconfigured, use Setup to enable it. Or, you can move the CMOS jumper on the server board from the default setting (protect CMOS memory) to the Clear setting; this will allow most server configurations to boot.	84
BIOS Update Utility	Use to update the BIOS or recover from a corrupted BIOS update.	93
Using the Adaptec SCSI Utility	Use to configure or view the settings of the SCSI host adapters and onboard SCSI devices in the server.	94

Hot Keys

To do this	Press these keys
Clear memory and reload the operating system—this is a system reset	<Ctrl+Alt+Del>
Secure the system immediately	<Ctrl+Alt>+hot key (Set the hot-key combination with the BIOS System Setup Utility.)

Power-On Self Test (POST)

Each time you turn on the system, POST starts running. POST checks the server board, processor, memory, keyboard, and most installed peripheral devices. During the memory test, POST displays the amount of memory that it is able to access and test. The length of time needed to test memory depends on the amount of memory installed. POST is stored in flash memory.

- 1 Turn on the video monitor and server. After a few seconds, POST begins to run.
- 2 After the memory test, the following screen prompts and messages appear until POST has completed running or until you press <F2>:

Press <F2> key if you want to run SETUP



NOTE: "Press <F12> to Network" refers to machines that need to boot from a network source. If you are unsure, contact your system administrator.

- 3 During peripheral device detection, the following message appears:
Press <Ctrl><A> to enter SCSI Utility
- 4 Press <Ctrl+A> if there are SCSI devices installed. When the utility starts, follow the instructions displayed to configure the onboard SCSI host adapter settings and to run the SCSI utilities. Also, see [Using the Adaptec SCSI Utility](#) on page 94. If you do not enter the SCSI utility, the boot process continues.
- 5 Press <Esc> during POST to display a boot menu when POST finishes. From this menu you can choose the boot device or enter BIOS Setup.

If you have a RAID card, the BIOS and drivers are initiated at this point in the process. If you want to configure the card, press <Ctrl>+<M>.

After POST is finished, the system beeps once.

What appears on the screen after this depends on whether you have an operating system (OS) loaded and, if so, which one. If the system halts before POST has completed running, the system beeps indicating a fatal system error that requires immediate attention.

If POST can display a message on the screen, the system beeps twice as the message appears.

BIOS Setup Utility

The BIOS Setup Utility is a menu-driven utility program that allows you to view and change basic motherboard settings.

Starting the BIOS Setup Utility

The BIOS screen appears when you start the server.

```
Phoenix BIOS 4.0 Release 6.0
Copyright 1985-2000 Phoenix Technologies
Ltd., All Rights Reserved
STL20+0.86B.XXXX.XXX.XXXXXXXXXXX
STL2+ Production Release XX.X

Intel(R) Pentium (R) III Processor XXX MHz
XXXXXXXXX Extended Memory ECC Initialized
XXXXXXXXX Extended Memory Passed
0256K Cache SRAM Passed
System BIOS Shadowed
Video BIOS Shadowed
UMB upper limit segment address : XXXX
Keyboard Detected
Mouse initialized
Press <F2> to enter SETUP
```

To start the BIOS Setup Utility, press the F2 key immediately after the BIOS screen appears. The message “Entering Setup...” appears on the screen. After the system completes the Power-On-Self-Test (POST), the BIOS Setup Utility is loaded.

If F2 is not pressed, the operating system is loaded after the Power-On-Self-Test (POST) sequence is completed.

BIOS Setup Utility Menu Options

The BIOS Setup Utility includes the following six menu options:

Main	Sets the system date and time, floppy disk drive parameters, and other data
Advanced	Sets details of hardware data such as serial port/parallel port parameters
Security	Registers, changes, and deletes passwords, and sets security mode
Server	Sets data on system management
Boot	Sets the boot sequence for the devices that can be booted
Exit	Exits the BIOS Setup Utility

BIOS Setup Utility Keyboard Commands

<F1>	Displays Help
<Esc>	Returns control to the previous screen mode
<Enter>	Specifies a menu or data item
↑	Returns control to the previous data item
↓	Advances control to the next data item
← →	Specifies a menu
F9	Resets all data settings to default values (except for the passwords)
F10	Saves data settings and exits the BIOS Setup Utility

Changing BIOS Settings

To change BIOS settings, follow these steps:

1 Move the black bar to the desired item using the arrow keys <↑> <↓>.

2 Press the <Enter> key.

The submenu corresponding to the selected item appears.

3 Set the value for the selected item.

4 Press the <Esc> key to exit the submenu.

5 After modifying all necessary data, save the modifications by pressing F10 and then pressing the <Enter> key.

BIOS Settings

This section describes the settings available in the various BIOS Setup Utility menus.

Main Menu

System Time:	[XX:XX:XX]
System Date:	[XX/XX/XXXX]
Diskette A:	[1.44/1.25MB 3 1/2"]
Diskette B:	[Disable]
Hard Disk Pre-Delay:	[Disable]
>Primary IDE Master	[CD-ROM]
>Primary IDE Slave	[None]
>Processor	
Language:	[English (US)]

System Time/System Date

Enter the system date and time.

Diskette A/Diskette B

Displays the type of connected floppy disk drive. **Do not change this setting.**

Hard Disk Pre-Delay

Sets a hard disk pre-delay.

Primary IDE Master/Primary IDE Slave

Displays the type of connected CD-ROM drive. **Do not change this setting.**

Processor Settings

Displays information about the system processor(s).

Processor Speed Setting

Displays the operating frequency of the CPU. You cannot set the CPU speed with this utility.

Processor 1 Type:

Displays the primary processor type.

Cache RAM

Displays the ID and cache size of the primary mounted CPU.

Processor 2 Type:

Displays the secondary processor type.

Cache RAM

Displays the ID and cache size of the secondary mounted CPU.

Processor #1 Status: Normal

Displays the status of the primary processor.

Processor #2 Status: None

Displays the status of the secondary processor.

Clear Processor Errors: Enter

Allows you to clear processor errors.

Processor Error Pause: Enabled

Specifies whether to enable or disable a processor pause when an error occurs.

Processor Serial Number: Disabled

Specifies whether the function corresponding to the serial number of the processor is enabled or disabled. To change the setting from “Disabled” to “Enabled,” you must clear the setting using the hardware setup switch. For more information, refer to Appendix C: [Jumper Settings](#) on page 173.

Language

Specifies the language to be used for the system BIOS. Do not change this setting.

Advanced Menu

This section describes the advanced settings available in the various BIOS Setup Utility menus.

```
Memory Reconfiguration
>Peripheral Configuration
>PCI Device
>Option ROM
>Numlock

Reset Configuration Data:    [No]
Installed O/S:               [Other]
```

Memory Configuration

The following submenu appears:

System Memory

Displays available system memory.

Extended Memory

Displays system extended memory.

DIMM Group #1 Status: Normal

Displays the status of DIMM group #1.

DIMM Group #2 - #4 Status: None

Displays the status of DIMM groups #2 - #4.

Clears DIMM Errors

Sets the clear DIMM errors feature.

DIMM Error Pause: Enabled

Specifies whether to enable or disable the DIMM error pause feature.

Peripheral Configuration

The following submenu appears:

Serial Port 1: 3F8, IRQ4

Sets the I/O port address and interrupt level for Serial Port 1.

Serial Port 2: 2F8, IRQ3

Sets the I/O port address and interrupt level for Serial Port 2.

Parallel port:378, IRQ7

Sets the I/O port address and interrupt level for the parallel port.

Parallel Mode: Output Only

Sets the operation mode for the serial port; select "Output Only."

Diskette Controller: Enabled

Sets whether the built-in floppy disk controller is to be enabled or disabled.

Mouse: Auto Detect

Do not change this setting.

SCSI Controller: Enabled

Do not change this setting.

LAN Controller: Enabled

Do not change this setting.

VGA Controller: Enabled

Do not change this setting.

USB Controller: Disabled

Sets the USB controller.

PCI Device

Sets up PCI devices. Do not change these settings.

Option ROM

Sets ROM for onboard SCSI, LAN and PCI slots 1-6.

Numlock

Sets keyboard click and repeat rates.

Reset Configuration Data

Do not change this setting.

Installed O/S

Do not change this setting.

Security Menu

This section describes the security settings available in the BIOS Setup Utility.

Supervisor Password is:	Clear
User Password is:	Clear
Set Supervisor Password	[Enter]
Set User Password	[Enter]
Password on Boot:	[Disabled]
Fixed Disk Boot Sector:	[Normal]
Diskette Access:	[User]
Secure Mode	
Power Switch Mask:	[Unmasked]
Option Rom Menu Mask:	[Unmasked]

Set Supervisor Password

Allows Supervisor Password to be registered, changed, and/or deleted.

Set User Password

Allows User Password to be registered, changed, and/or deleted.



HINT: For security reasons, the passwords do not appear on the screen. If you forget the passwords, shut down the server and clear the passwords. For more information, refer to Appendix C.

Password on Boot: Disabled

Specifies whether or not a password input request message is to be displayed when starting the operating system.

Fixed Disk Boot Sector: Normal

Do not change this setting.

Diskette Access: User

Do not change this setting.

Secure Mode

Sets the key for placing the system in Secure mode. To activate "Secure Mode" and its sub-menu, you must set both the Supervisor and User passwords. Once in Secure mode, the system ignores keyboard and mouse operations until you enter the User Password from the keyboard.

Power Switch Mask

Do not change this setting.

Option ROM Menu Mask

Do not change this setting.

System Menu

This section describes the server settings available in the BIOS Setup Utility.

```
>Wake on Events
  AC-LINK:                      [Last State]
  Error Log Initialization:     [Enter]
>Console Redirection
Assert NMI on PERR              [Enabled]
```

Wake on Events

Select this option to display a submenu allowing you to set the following options:

Wake on LAN

Specifies whether the Wake on LAN option is enabled or disabled.

Wake on Ring

Specifies whether the Wake on Ring option is enabled or disabled.

AC-LINK: Last State

Set the procedure and the system will follow if the AC power is interrupted.

Error Log Initialization

Initializes the Error Log when you press enter.

Console Redirection

Sets console redirection data. Select this option to display the submenu shown below. Do not change the settings.

Serial Port Address: Disabled**Baud Rate: 19.2K****Flow Control:XON/XOFF****Console Connection: Direct**

Assert NMI on PERR: Enabled

Enables or disables the detection of PCI bus system errors (PERR signal: PERR).

Boot Menu

This section describes the Boot options available in the BIOS Setup Utility. This menu allows you to set the sequence in which the operating system searches devices for the boot files. Do not change these settings.

Boot-time Diagnostic Screen	[Enabled]
>Boot Device Priority	
>Hard Drive	
>Removable Devices	

Boot-time Diagnostic Screen: Enabled

Specifies whether the POST screen mode is enabled or disabled during the system boot. Do not change this setting.

Boot Device Priority

Specifies the device from which the operating system is to be booted.

Hard Drive

Specifies the hard disk drive from which the operating system is to be booted per BBS.

Removable Devices

Specifies the boot sequence for the floppy disk drive and other removable storage devices.

Exit Menu

Save Change & Exit
Exit Without Saving Changes
Get Default Value
Load Previous Value
Save Changes

Save Change & Exit

Saves changes and restarts the system. Performs the same function as pressing the F10 key.

Exit Without Saving Changes

Discards all recent configuration changes, then restarts the server. When you select this item, the system displays the confirmation request message "Configuration has not been saved! Save before exiting?" Select No.

Get Default Value

Resets all setup options to their default values, except for passwords. Performs the same function as pressing the F9 key.

Load Previous Value

Resets all setup options to the previous saved values.

Save Changes

Saves changes.

Upgrading the BIOS

For information and procedures on upgrading the BIOS, please refer to the Toshiba web site at www.support.toshiba.com.

Using the Adaptec SCSI Utility

The onboard SCSI controller and any preinstalled SCSI devices are set up prior to shipping. Use the Onboard SCSI Utility when you add or replace a SCSI device in the device bay or need to confirm its configuration settings.

Starting the SCSI Utility

When the server is turned on or restarted, the monitor displays the onboard SCSI BIOS initialize message shown below. The display differs based on the type of SCSI device installed in the server.

```
Adaptec AIC-7899 SCSI BIOS vX.XX
(C)1998 Adaptec, Inc. All Rights Reserved.

<<Press <Ctrl> <A> for SCSISelect(TM)
Utility!>>>

Ch A,                               SCSI ID : 0
IBM DDYS-T36950M                     ULTRA2-LVD
                                   SCSI ID : 6
TOSHIBA SMC3.0                       ULTRA2-LVD

Ch B, SCSI ID : X XXXXXXXX
```

When the settings are correct, the SCSI ID and device name of the SCSI device connected to the onboard SCSI controller appear on the screen. To start the SCSI Utility, after the message “Press <Ctrl>+<A> for SCSI Select (TM) Utility!” appears on the screen, press the <Ctrl>+<A> keys.

Menu Configuration

When the SCSI Utility starts, the monitor enters the following main menu display mode:

```
Adaptec AIC-7896 < SCSISelect (TM) > Utility vX.XX

You have an AIC-7899
SCSI host adapter in your system. Move
the cursor to the bus : device: channel of
the one to be configured and
press <Enter>.
<F5>-Toggle color/monochrome
00:04:A
00:04:B

Arrow keys to move cursor, <Enter> to select option,
<Esc> to exit (*=default)
```

Selecting 00:04:A or 00:04:B in this mode changes the display to the device setting screen mode. The server has two on-board SCSI controllers and under its standard configuration (without an added RAID controller), the internal hard disk drive and the SCA Hot Swap Back Plane are connected to the controllers. Only use the “Configure/View Host Adapter Setting” when the server is in the device setting screen mode. Do not modify the “SCSI Disk Utilities” setting.

SCSI Utility Keyboard Commands

<Esc>	Returns control to the previous screen mode
<Enter>	Specifies a data item
<↑>	Returns control to the previous data item
<↓>	Advances control to the next data item

Changing SCSI Device Settings

- 1 Using the arrow keys (↑ ↓), select the desired item then press the <Enter> key.
The submenu or selection menu corresponding to the selected item appears.
- 2 Make any necessary changes then save the changes.
- 3 Select Exit this Menu to exit the submenu.

Setting Devices

Place the system in device setting screen mode then select Configure/View Host Adapter Setting to display the Adaptec Utility screen.

❖ Host Adapter SCSI ID: 7

Specifies the SCSI ID of the SCSI host adapter. Do not change this setting.

❖ SCSI Parity Checking: Enabled

Controls whether the host adapter performs parity checks and scans for normal data transfer through the SCSI bus.

❖ Host Adapter SCSI Termination: Enabled

Specifies whether the SCSI bus is to be terminated using the SCSI host adapter. Do not change this setting.

❖ Boot Device Options

Specifies the SCSI device from which the system is to be booted.

Boot Channel: A First

Selects the SCSI controller which boots the system. Do not change this setting.

Boot SCSI ID: 0

Selects the SCSI ID of the device which boots the system. Do not change this setting.

Boot LUN Number: 0

Selects the LUN of the device which boots the system. Do not change this setting.

SCSI Device Configuration

Specifies detailed configuration information for each SCSI device (SCSI ID).

Sync Transfer Rate (MB/Sec): 160

Specifies the maximum synchronous transfer rate of the onboard SCSI controller.

Initiate Wide Negotiation: Yes

Set this item to Yes to specify Wide SCSI (16 bit data width).

Enable Disconnection: Yes

Set this item to Yes to make the adapter activate the disconnect/reconnect function and permit multiple-command processing.

Send Start Unit Command: Yes

Specifies whether a start unit command is to be sent from the adapter to start the SCSI device.

Enable Write-Back Cache: N/C

Specifies whether to use the write-back cache.

BIOS Multiple LUN Support: No

Specifies whether logical unit numbers are supported.

Include in BIOS Scan: Yes

Specifies whether the device is to be scanned when SCSI BIOS starts.

Advanced Configuration Options

Sets up detailed data on the SCSI controller.

Reset SCSI Bus at IC Initialization: Enabled

Specifies whether or not to reset the SCSI bus during the SCSI controller resetting process.

Display <Ctrl><A> Message During BIOS Initialization: Enabled

Sets data to be displayed in the SCSI Utility startup message.

Extended BIOS Translation for DOS Drive > 1Gbyte: Enabled

Specifies whether extended BIOS is to be enabled or disabled for a DOS drive with a disk capacity exceeding 1 GB.

Verbose/Silent Mode: Verbose

Controls the data displayed during startup.

Host Adapter BIOS: Enabled

Enables or disables the Host SCSI Adapter BIOS.

Support Removable Disks Under BIOS as Fixed Disks: Boot Only

Specifies whether removable disks are to be supported under SCSI BIOS.

BIOS Support for Bootable CD-ROM: Enabled

Enables or disables startup from the CD-ROM drive.

BIOS Support for Int13 Extensions: Enabled

Enables or disables Int13 Extension.

Chapter 4

Hardware Diagnostics

About the Diagnostics Utility

Hardware (HW) Diagnostics starts a diagnostics test of the server hardware devices. You can select a single device or a combination of devices to test.

Use the HW Diagnostics Program to:

- ❖ Check for normal server operation
- ❖ Check for normal operation of optional devices
- ❖ Diagnose failures

Not all failures can be detected by the HW Diagnostics Program. You can also use the System Setup Utilities and check the error log for problems detected by the system board.

Starting Hardware Diagnostics

There are two ways to start the Hardware Diagnostic Program:

- ❖ From a diskette you first create using **Create Floppy Disks** in the Utilities menu
- ❖ From the Software Hardware Diagnostics Program stored in the Utility Partition (if you set up the Utility Partition at installation)

Starting up Using the Diskette

If the server is running, shut it down and turn it off.

- 1 Insert the HW Diagnostics diskette (you first create the diskette using **Create Floppy Disks** in the Utilities menu).
- 2 Turn on the server.
- 3 Select number **2, HW Diagnostics** from the boot menu.

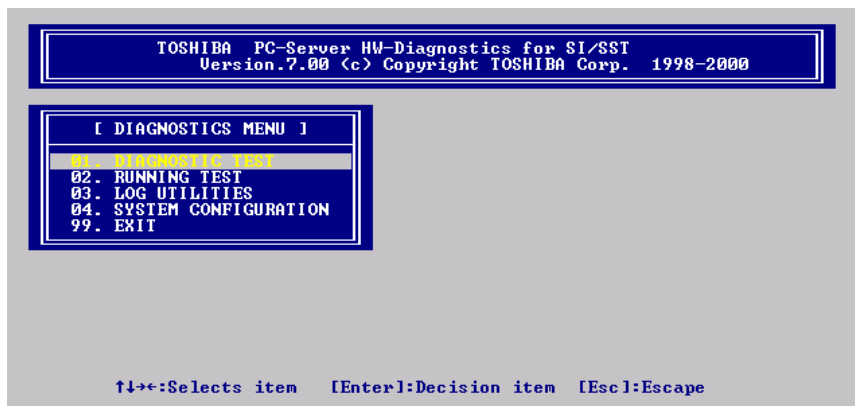
HW Diagnostics starts.



NOTE: To exit the HW Diagnostics program while in the Utility Partition, select Main Menu – Exit, then turn off the server.

Diagnostic Options

Press any key on the initial screen of the Toshiba HW Diagnostics Program and the main HW Diagnostics menu appears. Use the arrow buttons to select an item, then press **Enter**.



01. Diagnostic Test

Tests hardware.

02. Running Test

Automatically executes the diagnostics tests in a user-defined sequence.

03. Log Utilities

Displays error information.

04. System Configuration

Displays the system configuration.

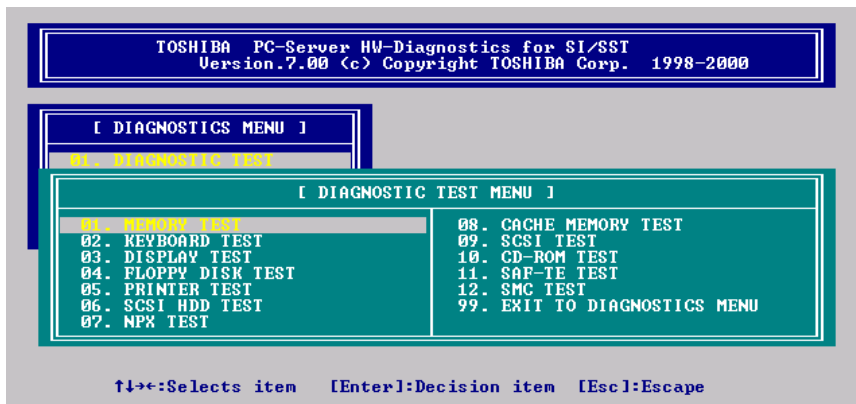
99. Exit

Terminates the HW Diagnostics Program, then the server reboots and the Software Menu appears.

01. Diagnostic Test

- 1 From the Diagnostic menu screen, select 01. DIAGNOSTIC TEST.

To return to the Main menu, select **99** or pres the **Esc** key.



The Diagnostic Test menu contains all of the hardware tests for the Magnia 3135R. To select a test, use the arrow keys to highlight the test then press **Enter**. Press **Esc** to return to the previous menu or **99** to return to the Diagnostics menu.

01. Diagnostic Test Menu Test Items

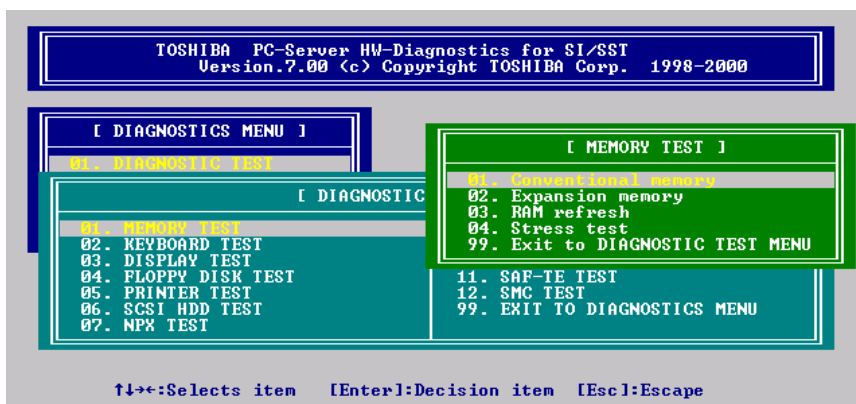
The 01. Diagnostic Test menu consists of 12 tests.

01. Memory Test

Tests the memory found in the 3135R.

- 1 Use the arrow keys to highlight 01. Memory Test on the Diagnostic Test menu.
- 2 Press **Enter**.

The following screen displays:

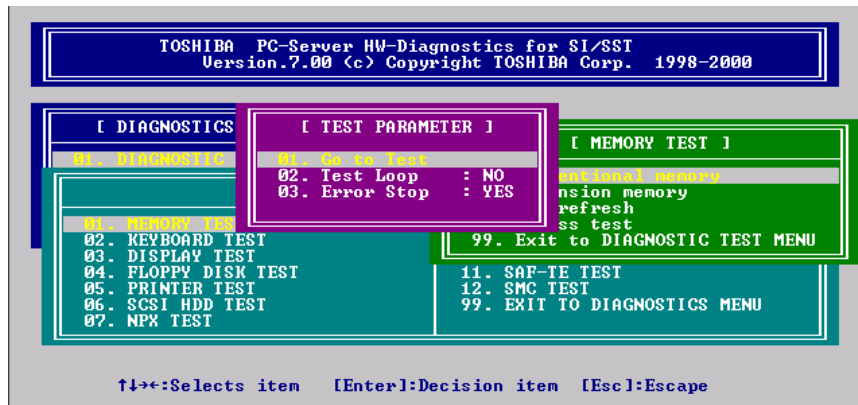


- 3 Using the arrow keys, select one of the following Memory tests.

❖ 01. Conventional memory

Writes data to conventional memory (0 to 640 KB), then reads the new data and compares the result with the test data.

When this Memory test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

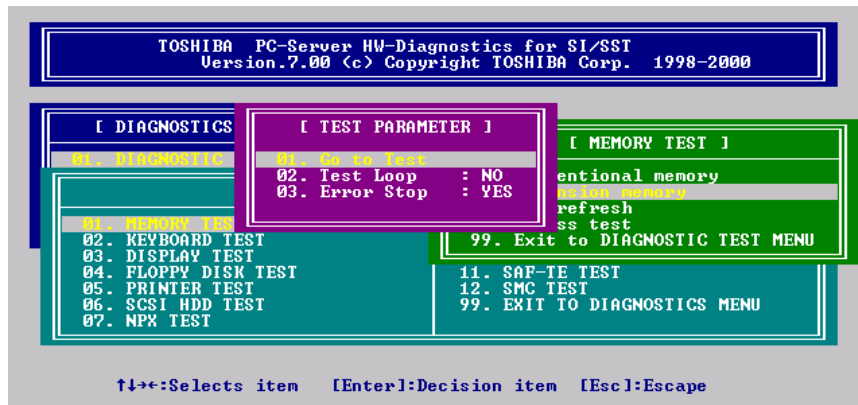
YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

❖ 02. Expansion memory

Writes constant data to the expansion memory (1024 KB and greater) then reads the data and compares it to the test data.

When this Memory test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

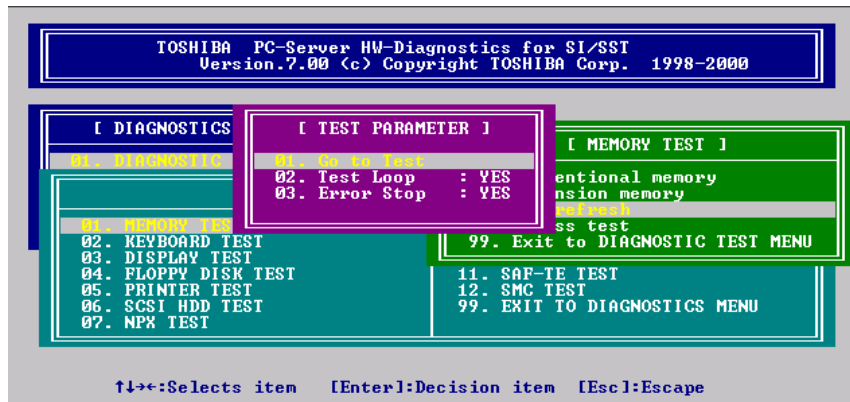
YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

❖ 03. RAM Refresh

Writes test data to the memory, then reads the data after one refresh cycle, comparing the data with the test data.

When this memory test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

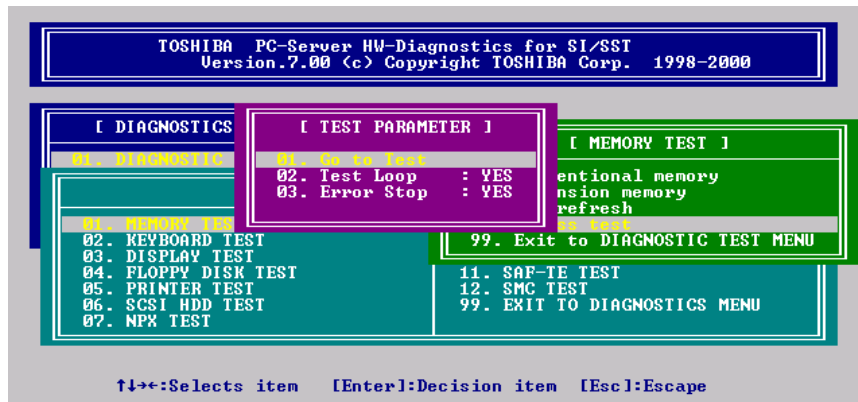
YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

❖ 04. Stress test

Writes data to the protected mode memory (from 1 MB to maximum), then reads the data and compress it with the write data.

When this Memory test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.



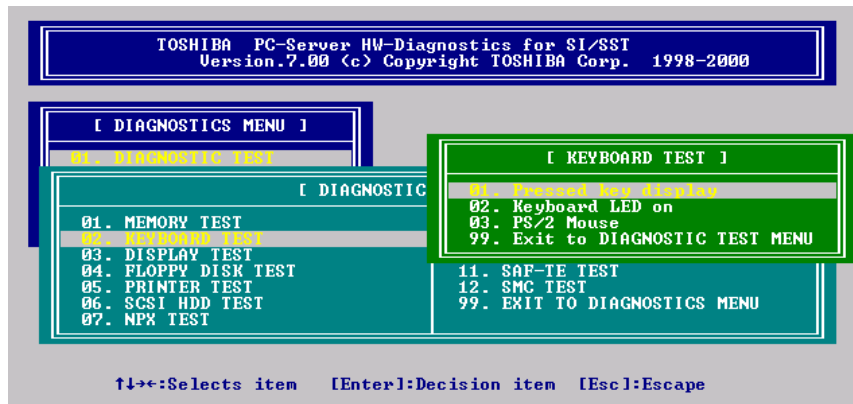
NOTE: 02. EXPANSION MEMORY, 03. RAM REFRESH and 04. STRESS TEST may take several hours to complete, depending on the amount of memory to test.

02. Keyboard Test

Tests the computer keyboard and mouse.

- 1 Use the arrow keys to highlight 02. Keyboard Test on the Diagnostic Test menu.
- 2 Press **Enter**.

The following screen displays:

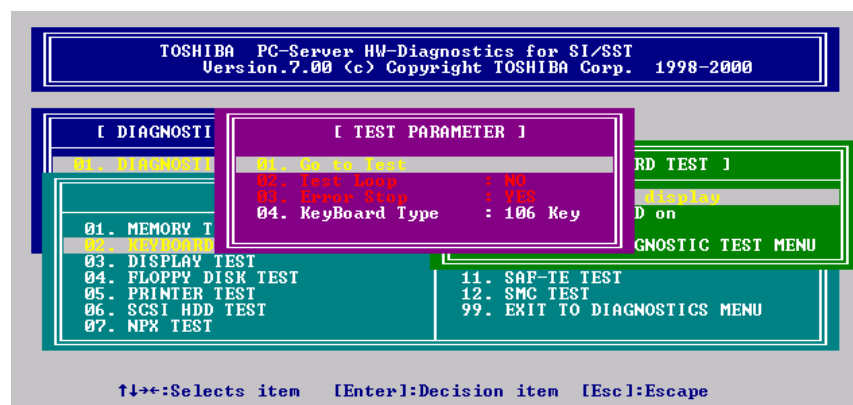


- 3 Using the arrow keys, select one of the following Keyboard tests.

❖ 01. Pressed key display

This test checks the function of the keyboard. The keyboard layout is drawn on the display. When any key is pressed, the corresponding key appears on the display. Pressing and holding a key enables the auto-repeat function causing the key's displayed character to blink.

When this Keyboard test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

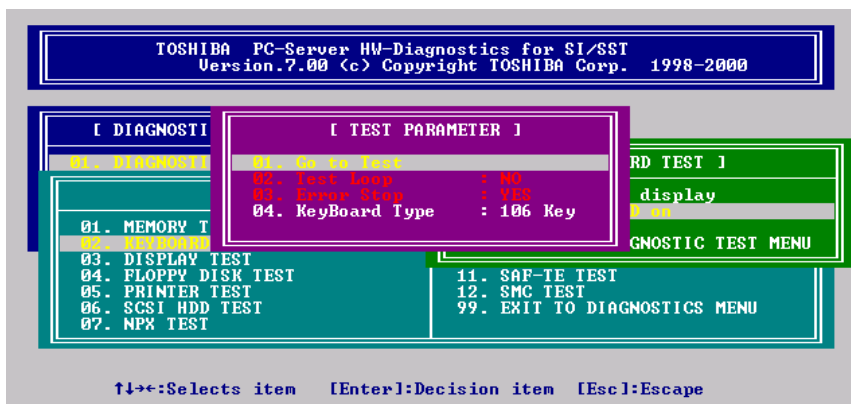
- 04. Keyboard Type

Press **Enter** to select the keyboard type.

❖ 02. Keyboard LED on

The system flashes the Num Lock, CapsLock, and Scroll Lock LEDs.

When this Keyboard test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

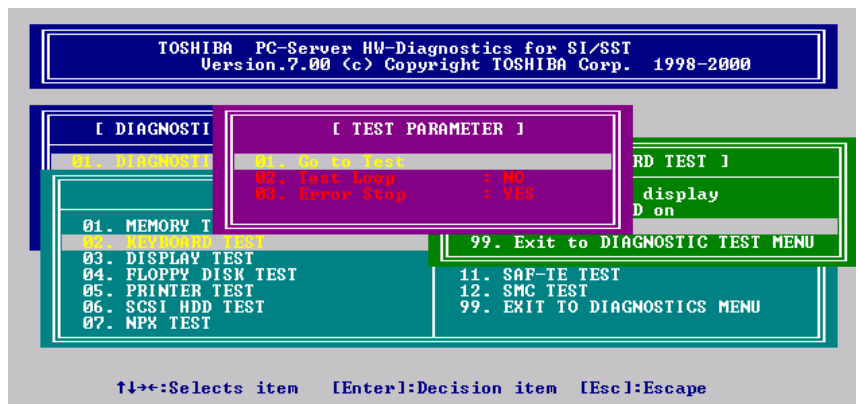
- 04. Keyboard Type

Press **Enter** to select the keyboard type.

❖ 03. PS/2 mouse

This subtest checks for a connected PS/2 mouse.

When this Keyboard test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

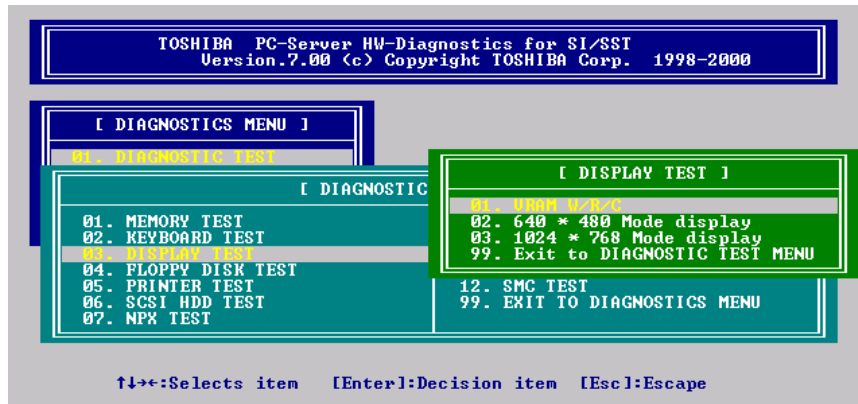
NO returns the subtest menu to the Main menu after the test is completed.

03. Display Test

Tests the function of the display.

- 1 Use the arrow keys to highlight 03. Display Test on the Diagnostic Test menu.
- 2 Press **Enter**.

The following screen displays:

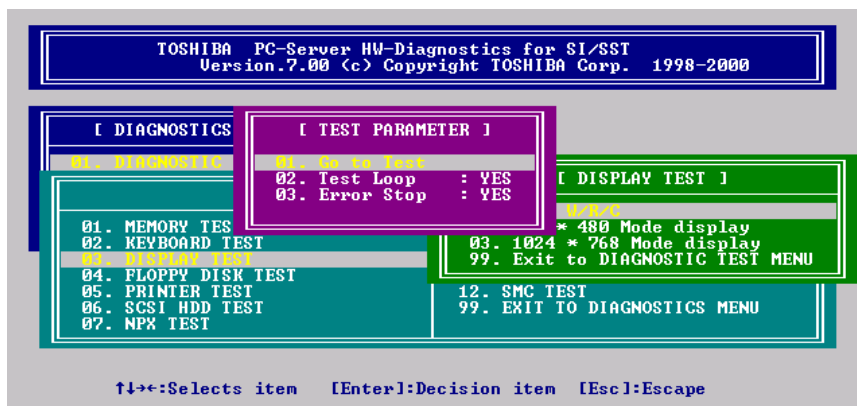


- 3 Using the arrow keys, select one of the following Display tests.

❖ 01. VRAM test

Verifies the video RAM can read, write and copy data.

When this Display test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

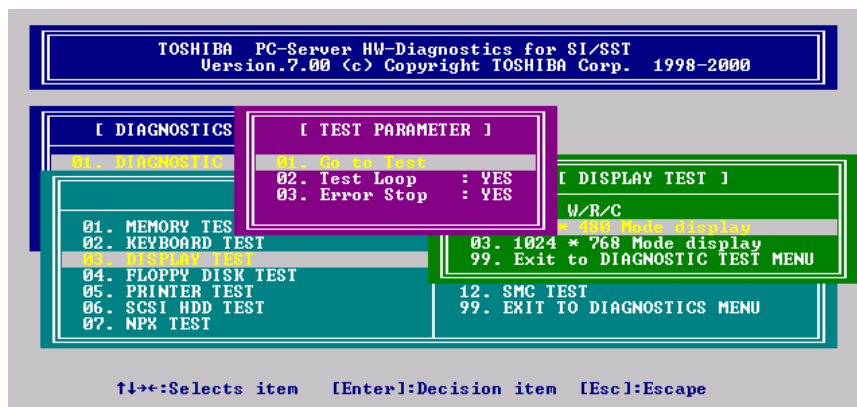
YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

❖ 02. 640 x 480 Mode display

Verifies the VRAM can display data in 640 x 480 mode.

When this Display test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

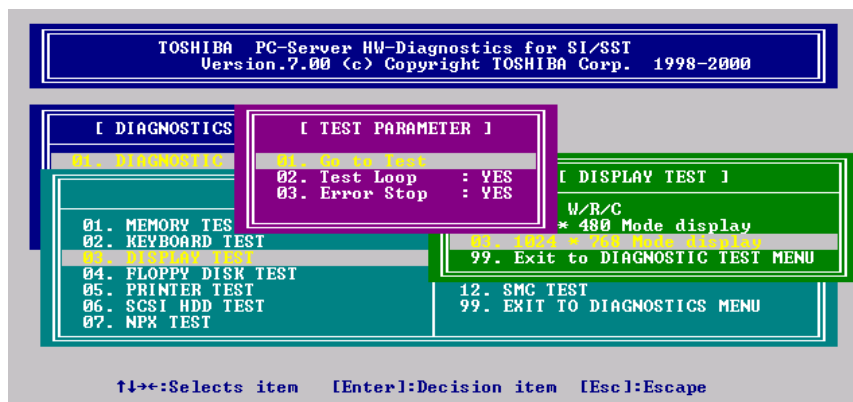
YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

❖ 03. 1024 x 768 Mode display

Verifies the VRAM can display data in 1024 x 768 mode.

When this Display test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

04. Floppy Disk Test

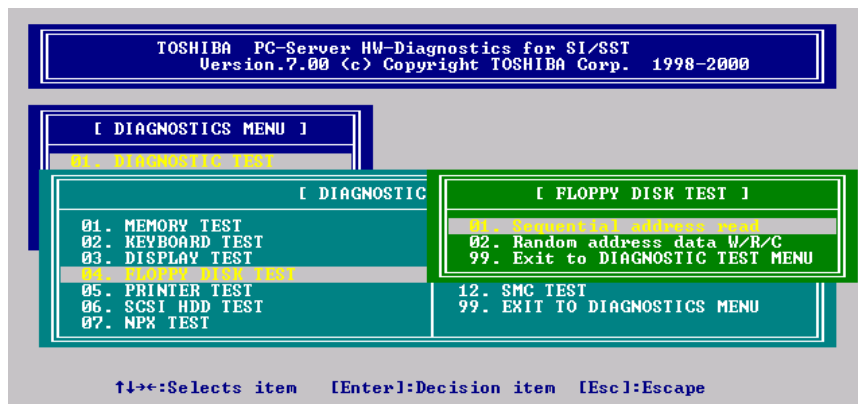


HINT: Before running the floppy disk test, insert a formatted diskette. Any contents on the diskette will be erased.

Tests the floppy disk drive.

- 1** Use the arrow keys to highlight 04. Floppy Disk Test on the Diagnostic Test menu.
- 2** Press **Enter**.

The following screen displays:

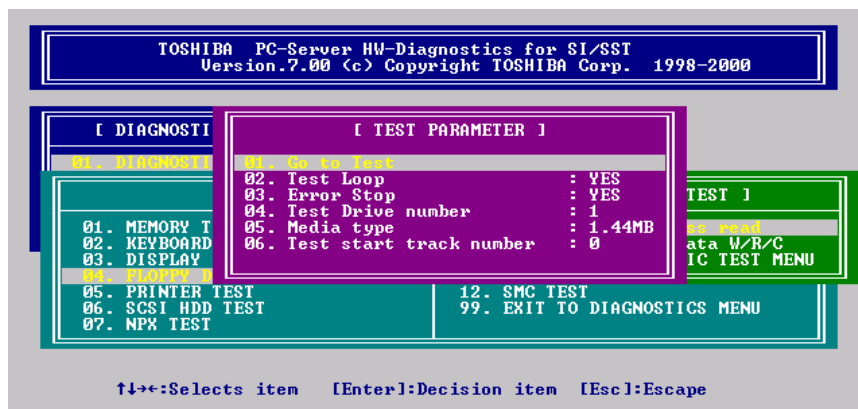


- 3** Using the arrow keys, select one of the following Floppy Disk tests.

❖ 01. Sequential address read

Tests that all of the tracks on the floppy disk are readable in sequence from the specified start point to the end.

When this Floppy Disk test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- ## - 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- ### - 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- Test Drive Number

Press **Enter** to select the drive number where the floppy disk is inserted.

- Media Type

Press **Enter** to select the format type of the diskette.

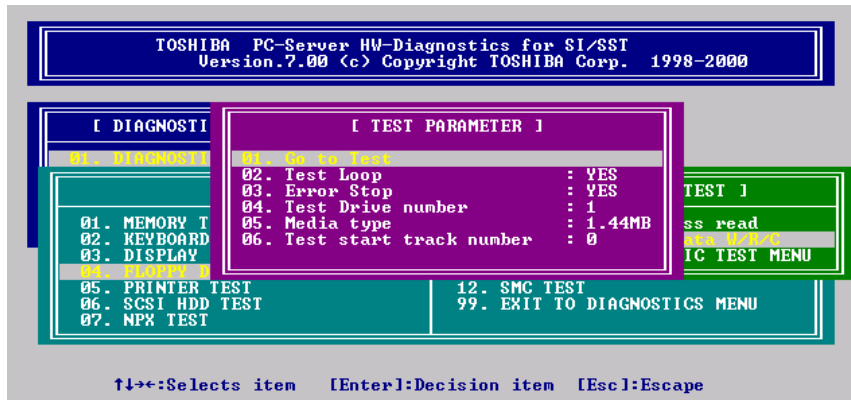
- Test Start Track Number

Press **Enter** to select the first track number for the test.

❖ 02. Random address data W/R/C

Verifies the floppy disk is read, write and copy capable in random access from a specified start point.

When this Floppy Disk test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- Test Drive Number

Press **Enter** to select the drive number where the floppy disk is inserted.

- Media Type

Press **Enter** to select the format type of the diskette.

- Test Start Track Number

Press **Enter** to select the first track number for the test.



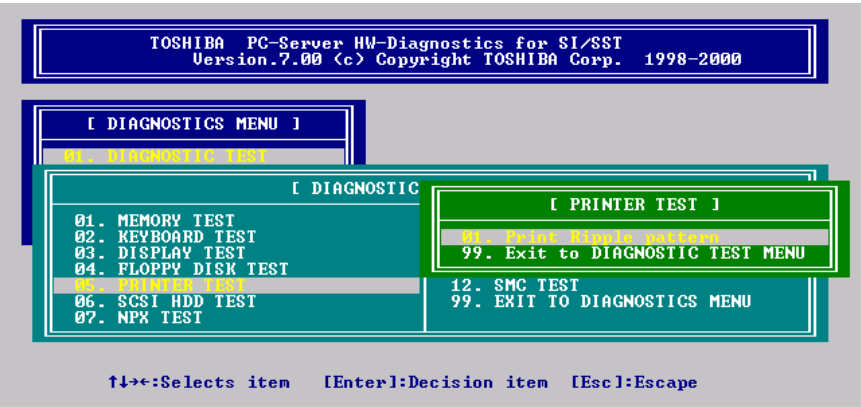
NOTE: When the HW Diagnostics program has been started from the diskette, replace the diskette for the test with the HW Diagnostics Program diskette after testing.

05. Printer Test

Tests the operation of the printer port.

- 1 Use the arrow keys to highlight 05. Printer Test on the Diagnostic Test menu.
- 2 Press **Enter**.

The following screen displays:

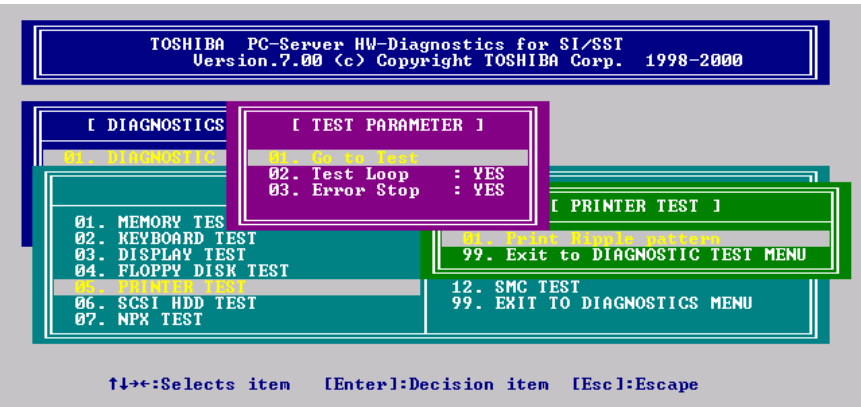


- 3 Using the arrow keys, select the Printer test.

❖ 01. Print Ripple pattern

Prints characters for codes 20h through 7Eh line-by-line while shifting one character to the left at the beginning of each new line.

When the Printer test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.



NOTE: An ESC / P-compatible printer must be connected to the system to run this test.

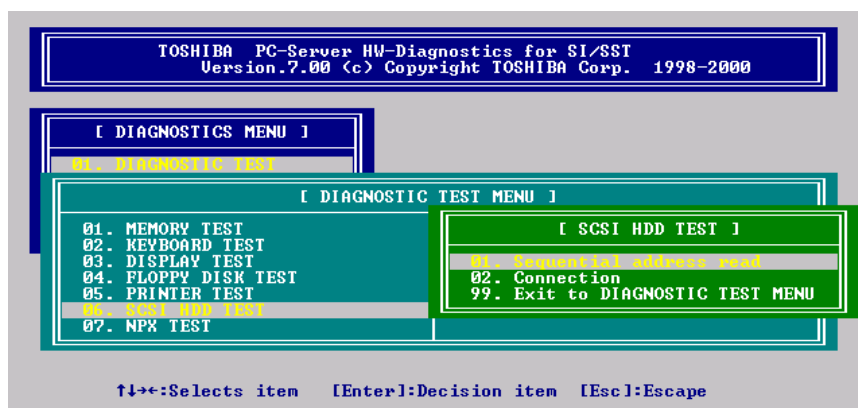
06. SCSI HDD Test

Checks the HDDs connected to the SCSI-Bus.

1 Use the arrow keys to highlight 06. SCSI HDD Test on the Diagnostic Test menu.

2 Press **Enter**.

The following screen displays:

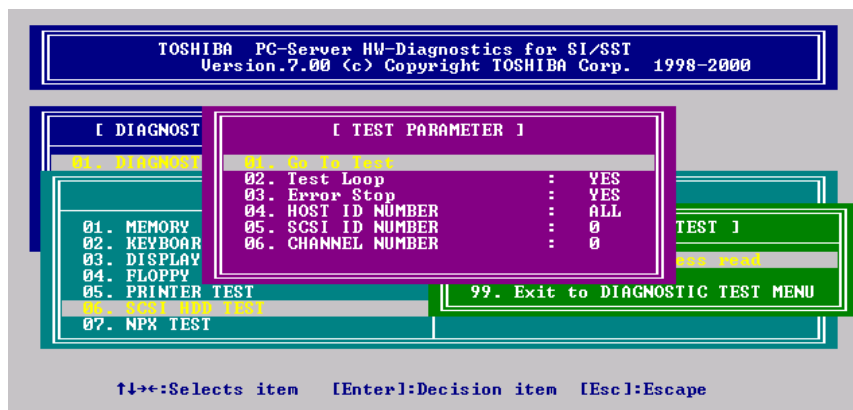


3 Using the arrow keys, select one of the following SCSI HDD tests.

❖ 01. Sequential address read

Sequentially reads all blocks on the specified HDD, starting at block 0.

When this SCSI HDD test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- Host ID number

Press **Enter** to select the HDD to be tested. Choose ALL to test all HDDs connected to the server.

- SCSI ID number

Press **Enter** to select the SCSI ID to test.

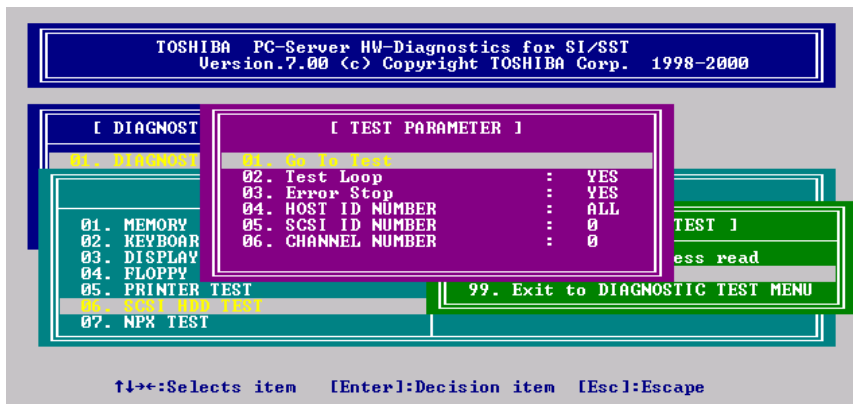
- Channel number

Press **Enter** to select the channel number to test.

❖ 02. Connection

Reads the logical sector at the end of the specified HDD to verify if the drive is connected or not.

When this SCSI HDD test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- Host ID number

Press **Enter** to select the HDD to be tested. Choose ALL to test all HDDs connected to the server.

- SCSI ID number

Press **Enter** to select the SCSI ID to test.

- Channel number

Press **Enter** to select the channel number to test.



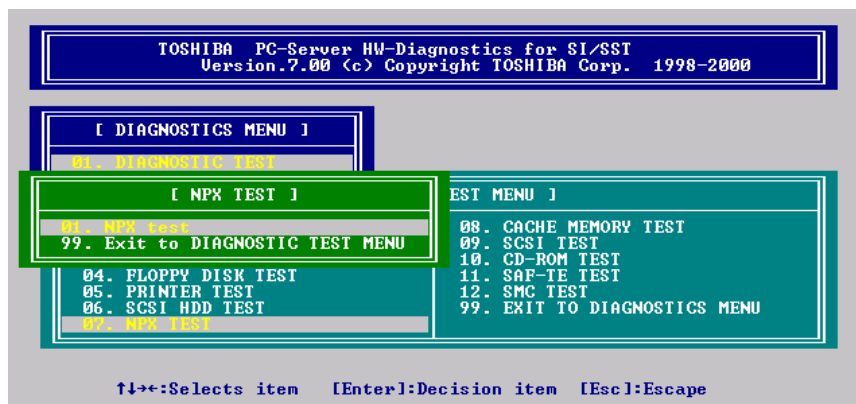
NOTE: The 01. SEQUENTIAL ADDRESS READ TEST checks all areas of the hard disk drive. If several hard disk drives are mounted, the test may take a few hours if ALL is selected for the Host ID number option.

07. NPX Test

Tests the computer's floating data processing unit functions.

- 1 Use the arrow keys to highlight 07. NPX Test on the Diagnostic Test menu.
- 2 Press **Enter**.

The following screen displays:

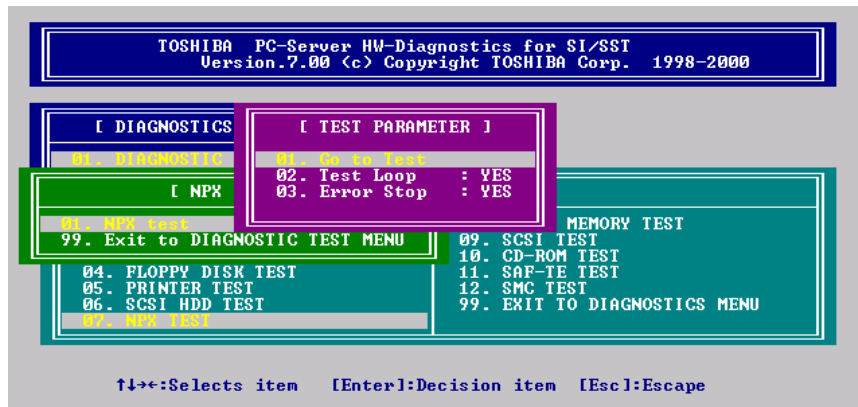


3 Using the arrow keys, select the following NPX test.

❖ 01. NPX test

Checks the addition and multiplication functions of the coprocessor.

When this NPX test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

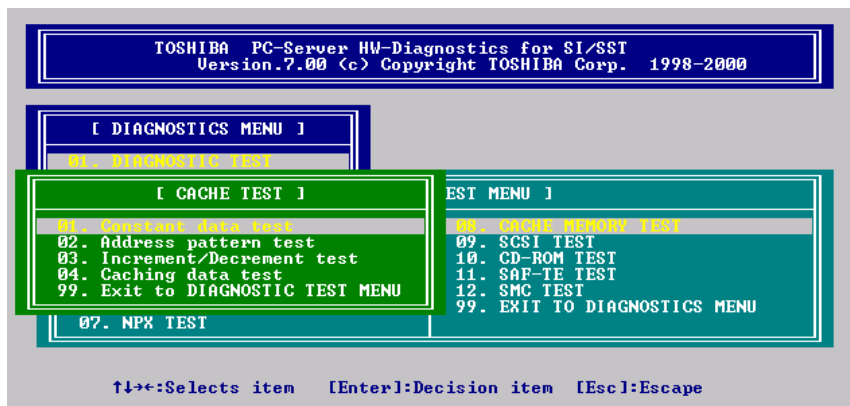
NO returns the subtest menu to the Main menu after the test is completed.

08. Cache Test

Tests the function of the cache memory.

- 1 Use the arrow keys to highlight 08. Cache Memory Test on the Diagnostic Test menu.
- 2 Press **Enter**.

The following screen displays:

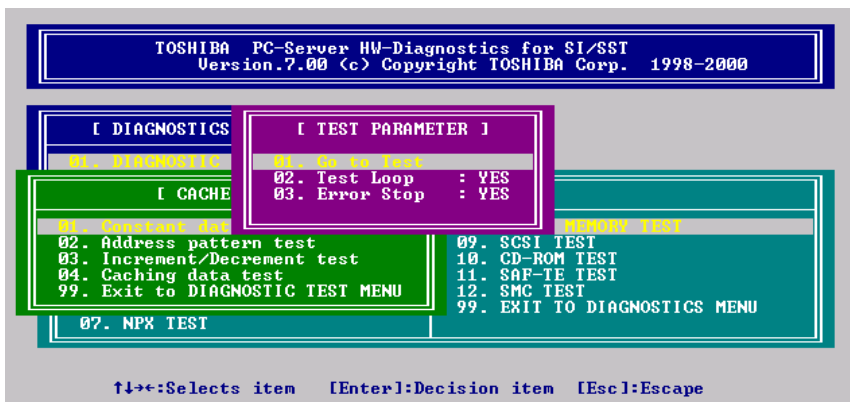


- 3 Using the arrow keys, select one of the following Cache tests.

❖ 01. Constant data test

Sends data to the cache, verifies it is there, reads it and then compares it to the test data.

When this Cache test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

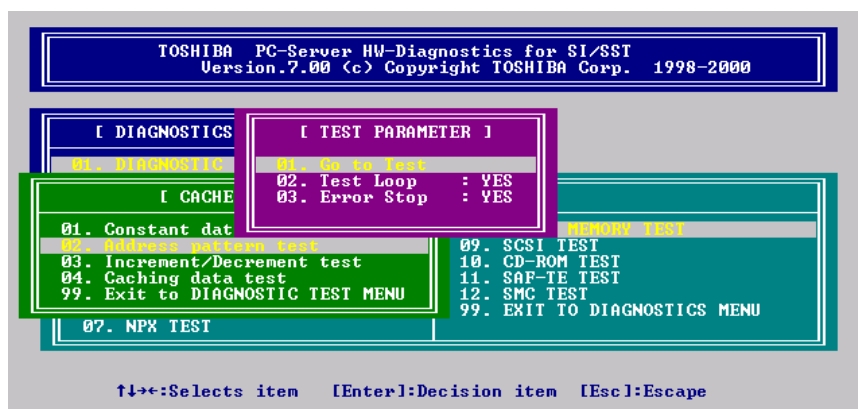
YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

❖ 02. Address pattern test

Sends data to the a specific cache memory address to verify the functionality of the address.

When this Cache test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

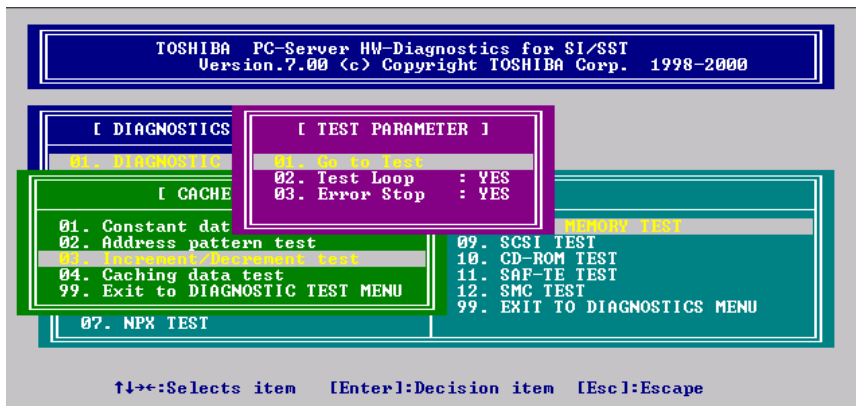
YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

❖ 03. Increment/Decrement test

Sends data to the cache to verify increment and decrement data.

When this Cache test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

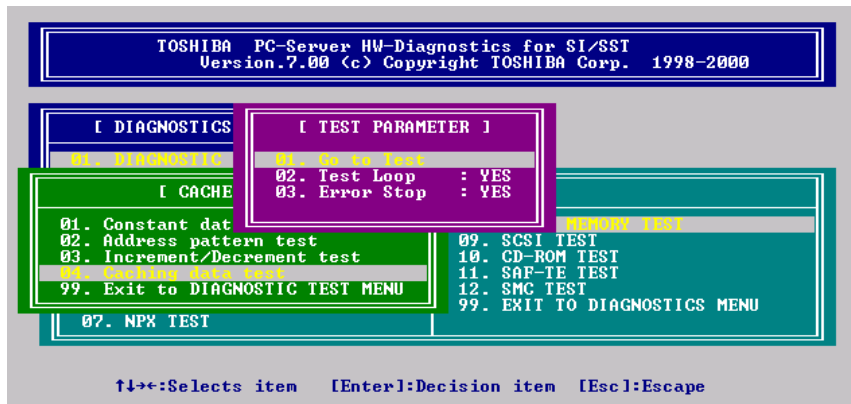
YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

❖ 04. Caching data test

Sends invalid data to the cache to verify that the cache controller recognizes it as invalid.

When this Cache test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

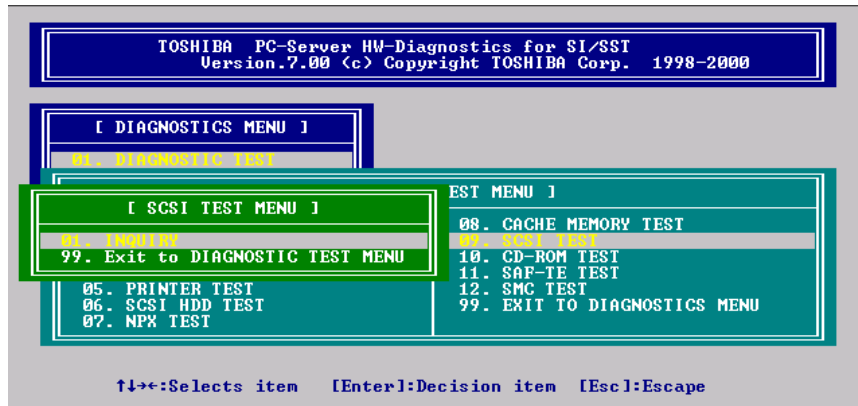
NO returns the subtest menu to the Main menu after the test is completed.

09. SCSI Test

Tests the SCSI devices connected to the server.

- 1 Use the arrow keys to highlight 09. SCSI Test menu on the Diagnostic Test menu.
- 2 Press **Enter**.

The following screen displays:

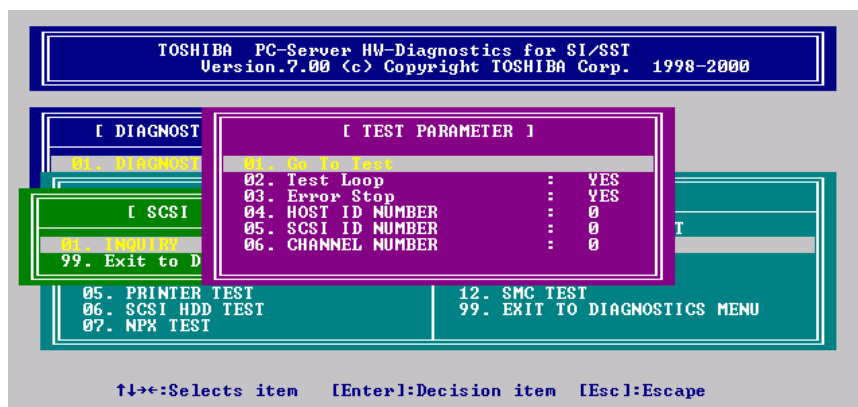


- 3 Using the arrow keys, select the SCSI test.

❖ 01. Inquiry

Checks the status of the selected SCSI device(s).

When this SCSI test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- Host ID number

Press **Enter** to select the device to be tested. Choose ALL to test all SCSI devices connected to the server.

- SCSI ID number

Press **Enter** to select the SCSI device to test.

- Channel number

Press **Enter** to select the channel number of the SCSI device to test.

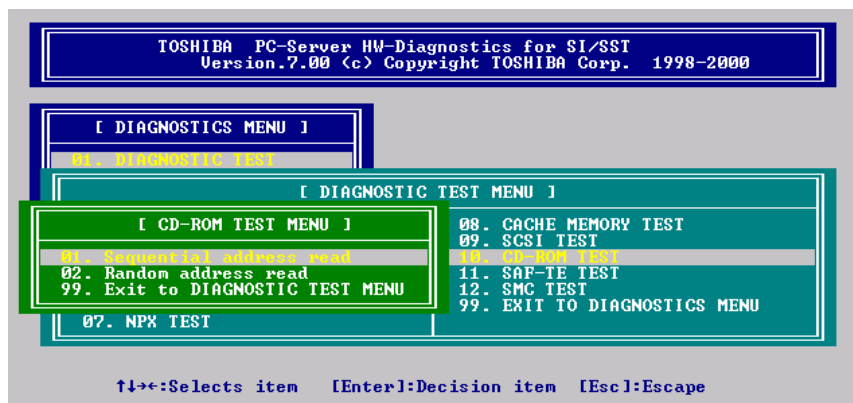
10. CD-ROM Test

Tests the computer's CD-ROM functions.

1 Use the arrow keys to highlight 10. CD-ROM Test on the Diagnostic Test menu.

2 Press **Enter**.

The following screen displays:

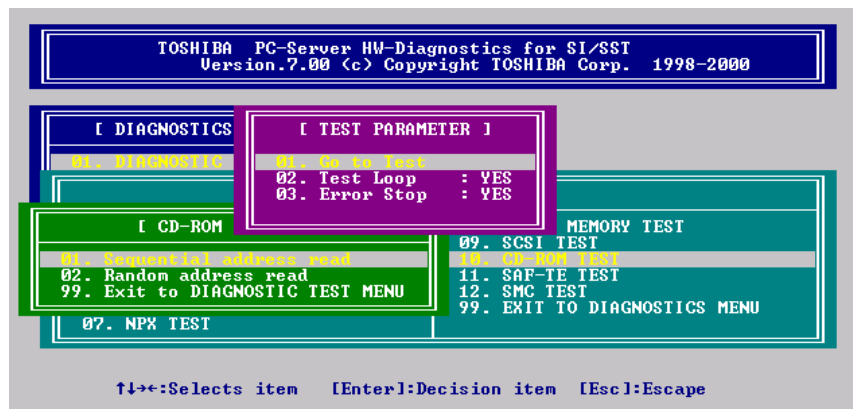


3 Using the arrow keys, select one of the following CD-ROM tests.

❖ 01 Sequential address read

Tests that all of the tracks on the CD-ROM are readable in sequence.

When this CD-ROM test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

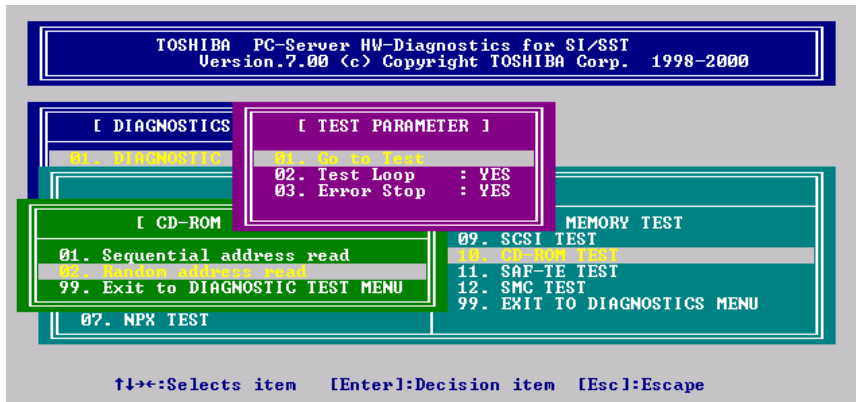
YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

❖ 02. Random address read

Verifies the floppy disk is read capable when randomly accessed.

When this CD-ROM test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

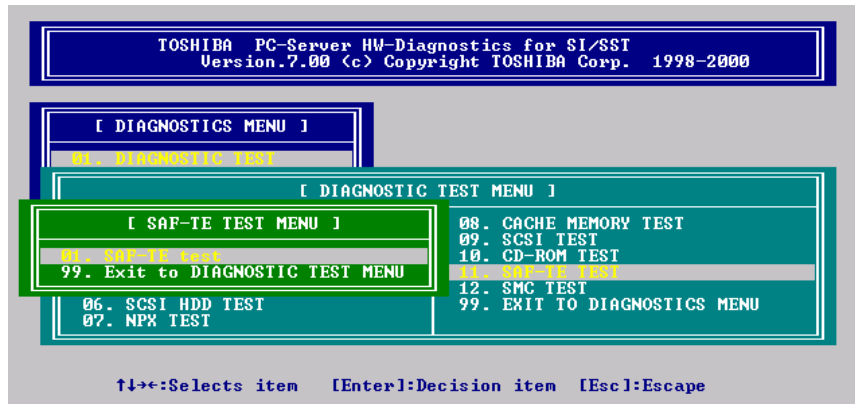
NO returns the subtest menu to the Main menu after the test is completed.

11. SAF-TE Test

Tests the SCSI drive bay.

- 1 Use the arrow keys to highlight 11. SAF-TE Test on the Diagnostic Test menu.
- 2 Press **Enter**.

The following screen displays:

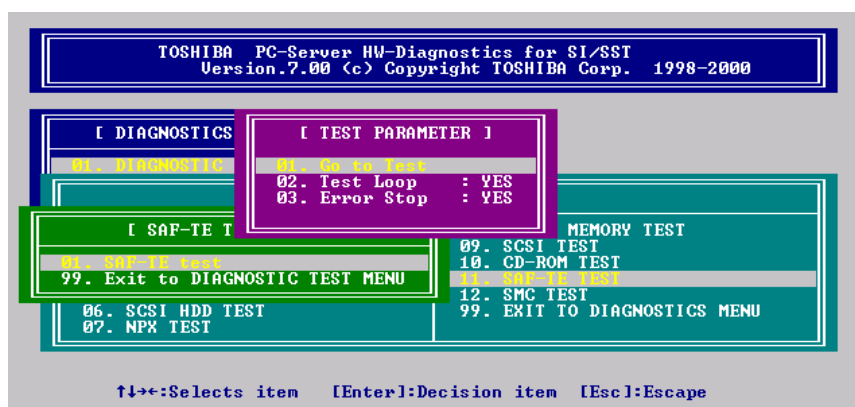


- 3 Using the arrow keys, select the SAF-TE test.

❖ 01. SAF-TE test

Detects the SAF-TE controller and checks the operation by flashing the LED for each hard disk drive.

When the SAF-TE test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

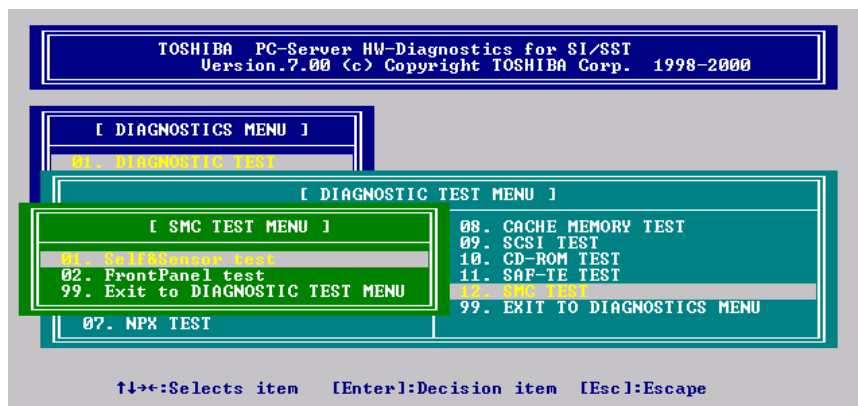
12. SMC Test

Tests server management controller.

1 Use the arrow keys to highlight 12. SMC Test on the Diagnostic Test menu.

2 Press **Enter**.

The following screen displays:

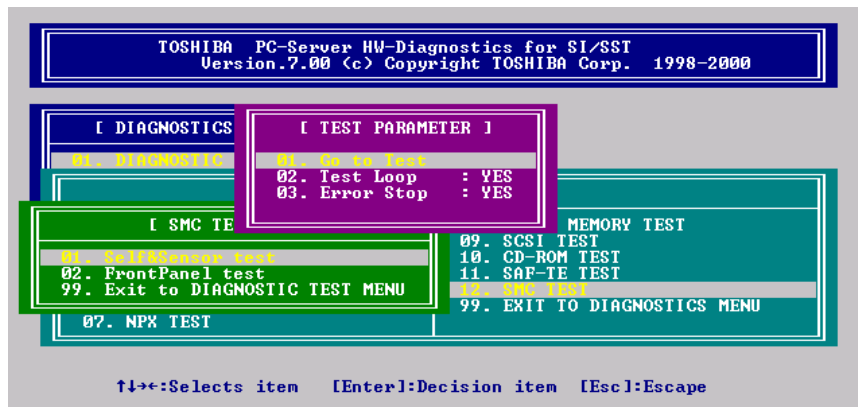


3 Using the arrow keys, select one of the following SMC tests.

❖ 01. Self&Sensor test

Checks the server management controller's chassis intrusion system, voltage regulation, temperature regulation, and fan speed

When this SMC test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

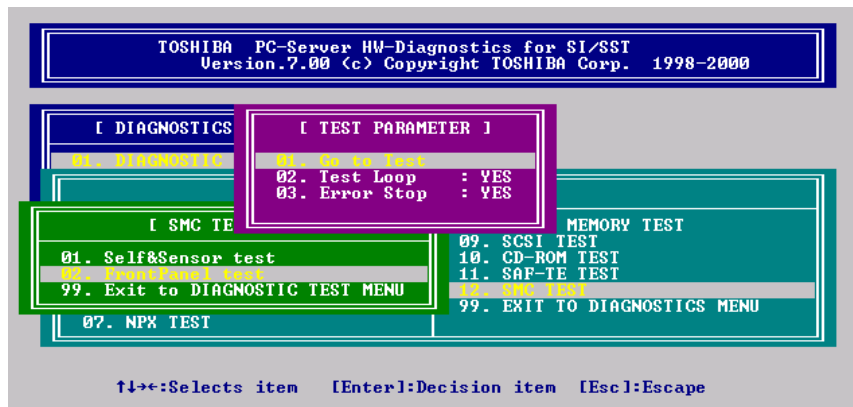
YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

❖ 02. Front Panel test

Verifies the functions of the server management controller's front panel LEDs and buttons.

When this SMC test is selected, the following screen displays:



Use the arrow keys to select the following:

- 01. Go to Test

Starts the test. To stop, press **Ctrl + Break**.

- 02. Test Loop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

NO returns the subtest menu to the Main menu after the test is completed.

- 03. Error Stop

Press **Enter** to toggle between YES and NO.

YES increments the pass counter each time the test cycle ends and restarts the test cycle.

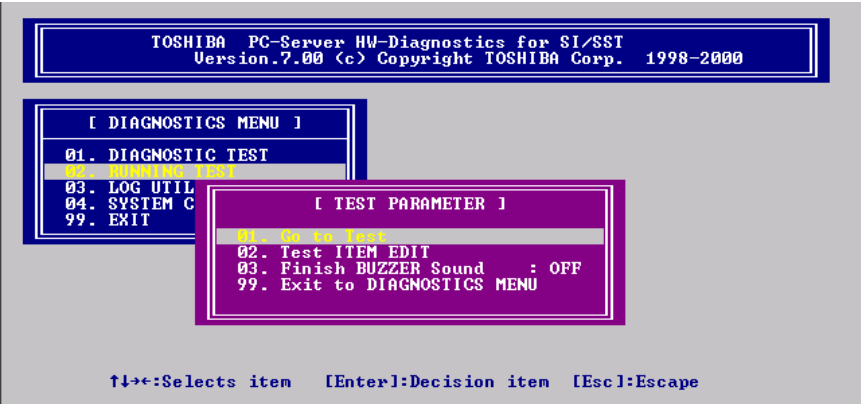
NO returns the subtest menu to the Main menu after the test is completed.

02. Running Test

02. Running Test allows the tests found in the 01. Diagnostic Test menu to be run singly or in groups.

- 1 Use the arrow keys to highlight 02. Running Test on the Diagnostic Menu.
- 2 Press **Enter**.

The following screen displays:



- 3 Use the arrow keys to select the following:
 - ❖ 01. Go to Test
Starts the test. To stop, press **Ctrl + Break**.
 - ❖ 02. Test ITEM EDIT
Selects the test(s) to be run from 02. Running Test.
 - a Use the arrow key to highlight Test ITEM EDIT.
 - b Press **Enter**.

The following screen displays:



- c** Use the arrow keys to highlight the desired test.
 - d** Press the **Tab** key for further instructions.
- ❖ 03. Finish BUZZER sound
- Sounds a beep when the server finishes the Running Test.



Notes: The running test setup is not saved on the HW Diagnostics disk. If you rerun the HW Diagnostics program, reselect your options.

Do not execute Running Test by selecting only the Cache test.

The 02. Keyboard Test needs keyboard input, which the test stops and waits for. If you want tests to run without input or stops, do not select the 02. Keyboard Test.

When selected tests complete, the following results appear on the screen:

OK	No error has been detected.
Failed	An error has been detected or the test has been stopped by a user.



NOTE: To check the error log, select 03. LOG UTILITIES from the main test menu. If the test has been halted, the test results are not displayed.

03. Log Utilities

Records error information generated while a test is in progress, storing the results in RAM. You can then store the data on a diskette or output the data to a printer.



NOTE: Print or save test results before selecting any other options or the information will be lost.
If the power switch is turned off, log utilities information is be lost.

To view the Log Utilities screen:

- 1 Use the arrow keys to highlight 03. Log Utilities on the Diagnostics Menu.
- 2 Press **Enter**.

The following screen displays:



Log Utilities screen headings

- ❖ xxxxx ERRORS
Displays the number of errors.
- ❖ CNT
Displays the order of occurrence of the error.

❖ TEST

Displays the abbreviation of the test

MEMORY TEST	RAM	NPX TEST	NPX
KEYBOARD TEST	KBD	CACHE MEMORY TEST	CAH
DISPLAY TEST	CRT	SCSI TEST	SCS
FLOPPY DISK TEST	FDD	CD-ROM TEST	CDR
PRINTER TEST	PRT	SAF-TE TEST	SAF
SCSI DISK TEST	HDD	SMC TEST	SMC

❖ Pass

Displays the pass count of the test with errors.

❖ STS

Displays the error status. See samples below:

Memory Test (RAM) Error Log

Status	Error name	Meaning
01	PARITY ERROR	Parity error
02	PROTECTED MODE NOT CHANGE ERROR	The shift to the protected mode failed
FF	DATA COMPARE ERROR	Data comparing error

Keyboard Test (KBD) Error Log

Status	Error name	Meaning
01	CLOCK LINE ERROR L	Clock line error (LOW)
02	CLOCK LINE ERROR H	Clock line error (HIGH)
03	DATA LINE ERROR L	Data line error (LOW)
04	DATA LINE ERROR H	Data line error (HIGH)
07	INTERFACE ERROR	Interface error
08	RESENDING ERROR	Sending/receiving error
09	ID ERROR	ID error
FF	DATA COMPARE ERROR	Data comparing error

Display Test (CRT) Error Log

Status	Error name	Meaning
FF	DATA COMPARE ERROR	Data comparing error

Floppy Disk Test (FDD) Error Log

Status	Error name	Meaning
01	BAD COMMAND ERROR	Bad command error
02	ADDRESS MARK NOT FOUND	The address mark has not been found
03	WRITE PROTECTED	Floppy disk is write-protected
04	RECORD NOT FOUND	The record has not been found
06	MEDIA CHANGE LINE ERROR	The media change line is bad
08	DMA OVERRUN ERROR	DMA OVERRUN occurred
09	DMA BOUNDARY ERROR	DMA BOUDARY occurred
10	CRC ERROR	CRC check error
20	FDC ERROR	FDC error
40	SEEK ERROR	Floppy disk seek error

Printer Test (PRT) Error Log

Status	Error name	Meaning
01	TIME OUT	Time out of printer control

SCSI HDD Tests (HDD)

Status	Error name	Meaning
01	CHECK CONDITION OR BAD COMMAND	Bad command error
03	DRIVE SELECTION FAILED	ID selection error
04	TARGET DRIVE BUSY	The target drive is busy
05	SCSI BUS TIME OUT	Time out error of SCSI bus
09	DMA BOUNDARY ERROR	DMA BOUNDARY occurred
0D	COMMAND TERMINATED	A command terminated
0E	QUEUE FULL	Command queue is full
80	NO SENSE	The sense data is invalid
81	RECOVERED ERROR	The execution of the command has correctly finished because of recovery treatment.
82	NOT READY	The condition does not satisfy the command execution
83	MEDIUM ERROR	An error occurred because of medium failure
84	HARDWARE ERROR	A fatal error occurred during command execution
85	ILLEGAL REQUEST	CBD is illegal

86	UNIT ATTENTION	The function of hard disk drive has been changed
87	DATA PROTECT	Data protection error
89	VENDOR UNIQUE	A unique error of disk maker
8A	COPY ABORTED	Halt of COPY command
8B	ABORTED COMMAND	The execution of a command is correctly stopped
8C	EQUAL	The search data command's comparing result is satisfied
8E	MIS COMPARE	Comparing command error
E0	STATUS ERROR	Status error
F0	OTHER ERROR	Other errors
FE	NO DRIVE ERROR	The target drive has not been found
FF	DATA COMPARE ERROR	Data comparing error

N* Definition of information details (DETAILS = AA BB CC DD EEEE FFFF)

AA: Channel number host number of the connected hard disk.

BB: Driver completion status

CC: ASPI status

DD: Host status

EEEE: Sense data

FFFF: Sense code

NPX TEST (NPX) Error Log

Status	Error name	Meaning
01	NO CO-PROCESSOR	Co-processor recognition error
02	CONTROL WORD ERROR	Set control word error
03	STATUS WORD ERROR	Status word error
04	BUS ERROR	BUS error
05	ADDITION ERROR	Addition test error
06	MULTIPLICATION ERROR	Multiplication test error
07	EXCEPTION ERROR	Exception error

Cache Memory Tests (CAH) Error Log

Status	Error name	Meaning
01	MEMORY PARITY ERROR	Memory parity error
02	PROTECT MODE ERROR	The shift to the protected mode failed.
03	CACHING ERROR	An error occurred on the cache system.
FF	DATA COMPARE ERROR	Data comparing error

SAF-TE test (SAF) Error Log

Status	Error name	Meaning
01	SAF-TE TEST ERROR	SAF-TE controller has not been detected.

❖ ADDR

Displays the address where the error occurred.

❖ WD

Displays the write-data at the occurrence of the error.

❖ RD

Displays the read-data at the occurrence of the error.

❖ Error Name / Details Status

Displays the error name and details. See STS above, on page 135.

Key Operation for Log Utilities

To scroll the error log screen or to save and to clear the error log information, use the following keys:

↓ key: scrolls to the next page.

↑ key: scrolls to the previous page.

Esc key: finishes the error log screen and returns to the main menu.

1 key: clears the error log information.

2 key: prints out the error log information.

3 key: reads the error log information saved on the floppy disk.

4 key: saves the error log information on the floppy disk.

Press Tab to see this list.



NOTE: When the error log information is cleared with the key operation above, the error information recorded on the diskette is also cleared.

System Configuration Display

When you select 04.System Configuration on the Diagnostics Menu, system information, SCSI device information and SMC information displays on screen.

You may use the following keys to access information on 04. System Configuration screens:

↑ ↓ : Select	Move the cursor to the connected device to check the detailed information.
Tab: Change	Changes to each information tab.
Esc: Escape	Terminates SYSTEM CONFIGURATION DISPLAY.

System Information

BIOS VER	BIOS version of the system motherboard
VIDEO INFORMATION	Amount of video RAM and the vendor information
CONVENTIONAL MEMORY	Amount of conventional memory
EXPANSION MEMORY	Amount of expansion memory
FLOPPY DISK DRIVE(S)	The number of floppy disk drives
PS/2 MOUSE	The number of PS/2 mice
RS-232C ADAPTER	The number of COM ports
PRINTER ADAPTER	The number of printer ports
LAN ADAPTER	LAN adapter type
CPU	The number of CPUs (family, model, and stepping number)
SCSI HOST ADAPTER	The name of the SCSI host adapter
SCSI DEVICES	
HDD	The number of hard disks
CMT	The number of CMT devices
SAF-FE	The number of SAF-TE drives
CD	The number of CD-ROM drives
MO	The number of MO devices
Others	The number of other SCSI devices
IDE CD-ROM DRIVE	The number of CD-ROM drives
AMS	Not supported
SMC REVISION	

SMC	Current version of the SMC
DMC0	Current version of the DMC0
DMC1	Current version of the DMC1
NPSS	Not supported
NPSS1	The number of power supply 1
NPSS2	The number of power supply 2
NPSS3	The number of power supply 3

SCSI Devices

The host and channel numbers are listed across the top of the screen, and the SCSI ID numbers are shown on the left. The SCSI devices are displayed under each channel.

You may use the arrow keys to select a particular device. Additional information is then displayed at the bottom of the screen.

System Configuration Information

The System Configuration Information screen shows revision information for the management devices on the server and the expansion disk units.

MAIN Chassis

Displays the versions of BMC, SMC, DMCO, and DMC1 installed on the server.

If the item is not installed on the server, it is displayed as **NON**.

Chapter 5

Software Installation

Before you can use the server, you need to install an operating system. During installation, you will need to provide adapter drivers designed specifically for the OS. After installation is complete, you may need to install updated drivers or utility programs to help manage the server. This document will help you prepare the correct drivers for the operating systems supported by Toshiba.



NOTE: This document assumes you have a basic understanding of the installation process for a variety of operating systems. The items in the CD-ROM:\Software folder are included to use as repair or recovery files, not for use during the installation of your operating system. Please refer to task specific documents provided in the *Magnia 3135R User's Guide* and your optional equipment for detailed information.

Startup

The server can start from a bootable CD-ROM, the hard disk with an operating system installed, or a bootable floppy diskette. Please refer to the root **readme.txt** file for instructions on creating a bootable floppy diskette that will access the CD-ROM drive.

Creating Floppy Diskettes for Drivers and Utilities

Create floppy disks that contain the drivers and utilities necessary to operate your server. Follow these steps to create the floppy disks for the drivers you need:

- ❖ On any computer with DOS, insert the Magnia 3135R CD-ROM into the CD drive.
- ❖ At a DOS prompt, change to the CD drive (i.e., **d:** <Enter>).
- ❖ Change to the <**CD-ROM**>:\Images (i.e., **cd images**) folder where you will find the following disk images:

1	ADA02.img = Adaptec 7899 NT/9x	1 Disk
2	ADA03.img = Adaptec 7899 Netware	1 Disk
3	AMINT.img = MegaRAID Drivers & Utility NT4	1 Disk
4	AMIW2K.img = MegaRAID Drivers & Utility W2K	1 Disk
5	AMINWDOS.img = MegaRAID Drivers & Utilities NW/ DOS	1 Disk
6	IDECD.img = CD-ROM (IDE) DOS	1 Disk
7	INT02.img = Intel Pro/100NT	1 Disk
8	INT03.img = Intel Pro/100 NW	1 Disk
9	RAGE2C.img = ATI Rage IIc Video Driver	1 Disk
10	TOS03.img = Toshiba HW Diagnostics	1 Disk
11	TOS07.img = Toshiba Display Power Save	1 Disk

- ❖ Insert a formatted floppy disk into the floppy drive **a:**.
- ❖ At the prompt, type **fdimg -w <filename.img> a**
- ❖ Insert additional disks as needed for multiple disk sets.
- ❖ Create a label for each set and apply to the floppy disks.

Windows NT Server 4.0



NOTE: Always connect a PS/2 mouse as your keyboard may not work with a serial mouse.

You will need to provide driver diskettes for the on-board and optional equipment during the installation of Windows NT 4.0. Please refer to **Installing Drivers** below.

If you have more than 1.7 GB of memory, Windows NT 4.0 cannot be properly installed. To install Windows NT 4.0:

- 1 Reduce the installed memory to less than 1.7 GB.
- 2 Install Windows NT.
- 3 Update Windows NT with Microsoft's Service Pack 6a or later.
- 4 Shut down the system and reinstall your additional memory.

Prepare your server's system configuration and RAID array (if the optional RAID adapter is installed) before starting the operating system installation. Refer to the *Magnia 3135R User's Guide* for detailed instructions on configuring the server.

You can install Windows NT Server 4.0 from a Windows 4.0 NT diskette set or the Microsoft CD-ROM using **F6** (the preferred method) when "*Setup is inspecting your computer's hardware configuration*" is displayed. Please refer to the installation documentation for details.

Installing Drivers

Prepare the following disks:

ADA02.img = Adaptec 7899 NT/9x

AMINT.img = MegaRAID Drivers & Utilities NT 4.0

INT02.img = Intel Pro/100 NT

The following information is from screens displayed when you press **F6** during the CD-ROM boot process and you have created the appropriate driver diskettes.

Onboard SCSI Controller

To select the driver for the onboard SCSI controller:

- 1** Select **S=Specify Additional Device**.
- 2** Select **Other (disk provided by hardware maker necessary)**.
- 3** Insert the diskette labeled *Adaptec 7899 Family Manager Set (NT 4.0)* into the diskette drive, and press Enter.
- 4** When a list of drivers appears on the screen, select **Adaptec Ultra160 Family PCI SCSI Controller (NT 4.0)**.
- 5** Continue the installation as instructed on the screen.

Express 500 RAID Controller

To select the driver for the RAID controller:

- 1** Press F6 when the following message appears on the DOS screen: "Setup is inspecting your computer's hardware configuration."
- 2** When the message "Specify additional SCSI adapters" is displayed, elect **S=Specify Additional Device**.
- 3** Select **Other**.
- 4** Insert the diskette labeled "MegaRAID NT" (supplied with the RAID Controller or created from the Create Floppy Disks utility) and press Enter.

- 5 When a list of drivers appears on the screen, select "**MEGARAID NT 4.0 RAID Driver**".
- 6 Follow the screen prompts to finish the installation.



NOTE: If the RAID Controller is installed on the server, be sure to install the Power Console Plus application after installing Windows NT Server 4.0. For more detailed information see the RAID Controller user's guide.

RAID Controller

To select the driver for the optional MegaRAID adapter card:

- 1 Select **S=Specify Additional Device**.
- 2 Select **Other (disk provided by hardware manufacturer necessary)**.
- 3 Insert the diskette labeled *AMI Drivers & Utilities* into the diskette drive and press enter.
- 4 When a list of drivers appears on the screen, select MegaRAID NT SCSI Driver.
- 5 Follow the on-screen instructions to complete the installation.



TECHNICAL NOTE: A RAID management utility, Power Console Plus needs to be installed and is included on the *Magnia 3135R Software and Documentation CD*. For installation and usage details, refer to the *MegaRAID User's Manual*.

Onboard Network Adapter

To install the onboard network adapter:

- 1 At the Installing Windows NT Networking menu, select **Wired to the Network**.
- 2 Select **Next**.
- 3 Choose **IIS or Not**.
- 4 Select **Start Search** where NT will find an Intel 82557 driver (this driver does not work and must be replaced).
- 5 Unselect it and click on **Select from List**.
- 6 From the driver selection menu, select **Have Disk**.
- 7 Insert the diskette labeled *Intel EtherExpress Pro 100+ Server Adapter Drivers (v3.1)* into the diskette drive and press Enter.

- 8 Select **Intel Pro Adapter** from the menu.
- 9 Select **Next** to continue the installation as instructed on screen.

After Windows NT 4.0 is installed

After installing the operating system, take the following steps:

Service Pack

Install Service Pack 6a, available from the Microsoft Web site.

Video Driver

You must change the video driver from the retail driver included in the Windows NT CD-ROM to the original video driver included in the *Magnia 3135R Software and Documentation CD*.

After installing the operating system:

- 1 Start Windows NT 4.0, and log in with Administrator or its equivalent.
- 2 Click **Start, Settings, Control Panel**, and then **Display** to start the Properties page.
- 3 From the Settings tab, click **Change** in the Display type.
- 4 Insert the *Magnia 3135R Software and Documentation CD* into the CD-ROM drive, or the floppy diskette created above into the floppy drive.
- 5 Select **Have Disk**.
- 6 Enter <CD-ROM>:\Software\Video\ or A:\.
- 7 Select **ATI Rage IIC**.
- 8 After it has loaded, restart the system before you test or make any changes to the video properties.
- 9 If you reinstall the Service Pack, please reinstall the video driver.

Other steps to take

- 1 Set up network **TCP/IP** if necessary. For the instructions, refer to the *Windows NT Server manual* or online Help.
- 2 Add **SNMP Service** into the network.
- 3 In Windows NT Server, open the Control Panel and select **Network, Service**.
- 4 Select the **Add** tab, find and select **SNMP Service**. For detailed instructions, refer to the *Windows NT Server manual* or online help.

- 5 Install the software for the MegaRAID adapter (if used). For installation instructions, refer to the *MegaRAID User's Manual*. Be sure to install the **MegaRAID SNMP** option.

Optional Software

Depending on the options you wish to use, please see the documentation for various utility programs that may help manage your server. We have provided the following software:

- 1 AMI MegaRAID Power Console Plus
- 2 Intel Server Control
- 3 Adobe Acrobat Reader 4.0 (for viewing files in PDF format)
- 4 Toshiba Hardware Diagnostic program (refer to the *Magnia 3135R User's Guide* for details)

Re-Installing Adapter Drivers

If it should become necessary to re-install the drivers to recover a corrupted file or repair your system and you do not have the floppy disks, the on-board and optional drivers are available on the *Magnia 3135R Software and Documentation CD*.

From the Software folder, please refer to the documentation in the respective driver folders for installation instructions.

For the drivers listed below, we have provided special instructions to reload them from the CD:

Onboard SCSI Controller

- 1 Select **Control Panel** from **Settings** on the Windows **Start** button.
- 2 Double-click the **SCSI Adapters** icon.
- 3 Select the **Drivers** tab.
- 4 Click the **Add** button.
- 5 When the Install Driver dialog displays, click the **Have Disk...** button.
- 6 Click **Browse**.
- 7 Find the Adaptec NT drivers in the `\Software\AIC7899\Disk1\NT4\` directory.
- 8 Select **Adaptec 29160(N), 39160, AHA-3960D, AIC-7892/7899 Ultra160 PCI SCSI Controller (NT 4.0)**.

- 9 Restart your machine as instructed.



NOTE: It is necessary to reinstall Service Pack 6a when the installation is complete.

Intel Pro100NT Driver

- 1 Select **Control Panel** from **Settings** on the Windows **Start** button.
- 2 Double-click the **Network** icon.
- 3 Select the **Adapters** tab.
- 4 Select **Intel 82559 Fast Ethernet LAN on Motherboard**.
- 5 Click **Remove**.
- 6 When the Warning dialog displays, click **Yes**.
- 7 When the Setup dialog displays, click **No**.
- 8 Click **Close**, then click **Yes** to restart the system.
- 9 After restarting, repeat steps 1-3.
- 10 Click **Add**.
- 11 When the Select Network Adapter dialog displays, click the **Have Disk...** button.
- 12 When the Insert Disk dialog displays, type the path to the Intel Pro Adapter driver. Substitute your CD-ROMs drive letter for Z: **Z:\Software\Pro100\Pro100NT**
- 13 The Select OEM Option dialog should display with only one available driver. Select **Intel PRO Adapter** and click **OK**.
- 14 The Intel Pro100 82559 driver should be listed in the Network properties. Close the control panel.
- 15 Configure the network settings as required by your network environment.
- 16 Restart your machine when prompted.



NOTE: It is necessary to reinstall Service Pack 6a when the installation is complete.

Windows 2000 Server

At the time of publication, the drivers on the Microsoft Windows 2000 Server installation CD were the latest drivers available for the hardware supplied with the Magnia 3135R Server with the exception of the MegaRAID driver for the optional Express 500 RAID card.

To setup your server's hardware configuration, please refer to the *Magnia 3135R User's Guide*, available in the \Docs folder on the *Magnia 3135R Software and Documentation CD*.

Please plan and initiate the Microsoft Windows 2000 Server installation using the documentation that came with the installation CD.

Express 500 RAID Controller

To select the driver for the RAID controller:

- 1 Press F6 when the following Setup message appears on the DOS screen: "Setup is inspecting your computer's hardware configuration."
- 2 When the message "Specify additional SCSI adapters" is displayed, select **S=Specify Additional Device**.
- 3 Highlight "Other" on the next screen, and insert the floppy disk labeled "MegaRAID W2K".
- 4 Press Enter.
- 5 When a list of drivers appears on the screen, select "**MegaRAID Express 500; Enterprise 1600; Elite 1600 RAID Controller Driver**" and press Enter.
- 6 Follow the screen prompts to finish the installation.



NOTE: If the RAID Controller is installed on the server, be sure to install the Power Console Plus application after installing Windows 2000 Server. For more detailed information see the RAID Controller user's guide.

Installing Toshiba Display Power Save Driver

You must install the Toshiba Display Power Save Driver after installing Windows 2000 on your Toshiba server.

The drivers for other Toshiba supported adapter cards are available on the Microsoft Windows 2000 Setup CD-ROM and do not require additional steps to be taken to be installed.

To install the Toshiba Display Power Save Driver:

- 1 Log on as Administrator or its equivalent.
- 2 Insert the floppy disk labeled *Toshiba Display Power Save Driver* or from the **\\SOFTWARE\\TDPSV** on the *Magnia 3135R Software and Documentation CD*.
- 3 Run **setup.exe**, or using the floppy, click **Start, Run**, type **a:\setup** and press Enter.
- 4 Reboot the system after the driver is installed.

After Windows 2000 Server is installed

Depending on the options you wish to use, please see the documentation for the various utility programs that may be of help managing your server. We have provided the following software:

- ❖ AMI MegaRAID Power Console Plus
- ❖ Intel Server Control Utility
- ❖ Adobe Acrobat Reader 4.0 (for viewing files in a PDF format)
- ❖ Toshiba Hardware Diagnostic program (refer to the *Magnia 3135R User's Guide* for details)

Installing Netware



NOTE: At the time the system was released, NetWare was not fully tested.

Motherboard settings

Check the settings of the motherboard.

- ❖ Start the BIOS Setup Utility.
- ❖ Select **PNP/PCI Configuration** and make sure the following is set correctly:
Plug and Play Aware O/S: NO

Floppy disk preparation

To install NetWare, you need to create the following driver diskettes:



NOTE: See the README.TXT file at the root of the CD-ROM for details on how to use the FDIMG.EXE file to create driver diskettes.

- ❖ Adaptec 7899 Family Manager Set v.1.10.

Manually installing NetWare 5.1

Selecting the driver

When the NetWare 5.1 installation starts, it detects the SCSI controller and the network adapter, and automatically assigns drivers contained on the NetWare CD-ROM.

Selecting a RAID Controller driver

The NetWare 5.1 installation program currently installs the correct drivers for the AMI MegaRAID Express 500 RAID card. Attempting to update the default drivers with those provided on the *Magnia 3135R Software and Documentation CD-ROM* may result in unreliable server behavior.

Complete the installation by following the on-screen instructions.

Selecting a SCSI Controller driver

If the installer detects a SCSI controller, the following menu appears:

The following drivers were detected for this server. Add, change or delete device drivers as needed.

Device types	Driver names
Platform Support Module:	MPS14
HotPlug Support Module:	(optional)
Storage adapters	IDEATA, IDEATA

options

_Continue

_Modify

- 1 Move the cursor to "Storage adapters" on the menu shown above with the arrow keys, and press Enter.
- 2 Set the floppy disk labeled "Ultra160 for Netware" in the floppy disk drive, and select **"Add an unlisted driver <Ins>"** by pressing the Insert key twice.
- 3 Press Enter to retrieve drivers contained on the floppy disk.

The following drivers are added to the screen above. (Two drivers are added because the Onboard SCSI has two channels.)

```
|| ADPT160M.HAM ||
|| ADPT160M.HAM ||
```

- 4 Select **"Return to driver summary"** and press Enter.
- 5 Select **_Continue** and complete the installation by following the on-screen instructions.

Selecting the RAID Controller driver

- 1 Select the Onboard SCSI Controller as instructed above.
- 2 Move the cursor to "Storage adapters" on the menu shown above with the arrow keys, and press Enter.
- 3 Set the floppy disk labeled "MegaRAID NW/DOS" in the floppy disk drive, and select **"Add an unlisted driver <Ins>"** by pressing the Insert key twice.
- 4 Press F3 to designate the directory on the floppy disk as A:\Netware and press Enter to retrieve drivers contained on the floppy disk.

The following drivers are added to the screen above.

|| MEGA4_XX.HAM || AMI MegaRAID XXX Adapter ||

- 5 Select **"Return to driver summary"** and press Enter and proceed with the installation.



NOTE: See the README.TXT file at the root of the CD-ROM for details on how to use the FDIMG.EXE file to create driver diskettes.

Selecting a Network Adapter driver

If the installer detects the network adapter, the following screen appears:

The following drivers were detected for this server. Add, change or delete device drivers as needed.				
Device types	Driver names			
Storage Devices:	IDECD, SCSIND			
Network boards:	CE100B			
NetWare loadable modules	(optional)			
<table><tr><td>options</td></tr><tr><td>_Continue</td></tr><tr><td>_Modify</td></tr></table>		options	_Continue	_Modify
options				
_Continue				
_Modify				

Select **_Continue** and complete the installation by following the on-screen instructions.

Post installation procedures

Setup the RAID Controller Utility

If a RAID controller is connected to the server, be sure to set up the MegaRAID Manager after installing NetWare. If the MegaRAID Manager is not set up, the system cannot be recovered from disk trouble during operation.

For details, refer to the *MegaRAID Software Guide*.

Chapter 6

If Something Goes Wrong

This chapter helps you identify problems that may occur while your server is in use and suggests solutions.

Identifying a Problem

To isolate a failure, it may be necessary to disconnect all peripheral devices connected to the server, except the keyboard and the monitor.

- 1 If a critical fault condition exists or you are disconnecting peripheral devices connected to the server, shut down the operating system and power off the server and peripherals.



CAUTION: Do not disconnect server cables and/or any connected peripheral devices while the server is on. Disconnecting these cables and/or devices while the server is on can cause irreparable damage to the server and peripherals.

- 2 Make certain that the server and monitor power cords are connected correctly to grounded AC outlets.
- 3 Check that the keyboard and the monitor are connected correctly to the server.
- 4 Turn on the monitor and adjust the brightness and contrast levels to two-thirds or more of their maximum values.
- 5 Make sure the floppy disk drive is empty.
- 6 Press the Power button to turn on the server.

The server starts running and the Power indicator light is green. If the power indicator does not turn green, see [The Power Indicator Does Not Light](#) on page 158.

- 7 After the server starts, check the operation of the POST. The POST detects error conditions and determines whether the problem is caused by the motherboard, the keyboard, or an inappropriate setup.



HINT: If the server stops before completing the POST, a fatal system error has occurred and you must take immediate action. Write down any error message that appears on the screen and take note of the tones generated by the speaker (such as a “beep” code). This information will be very useful if you need to contact Toshiba for assistance or service.

- 8 Make sure that the FDD indicator on the floppy disk drive comes on when the drive is accessed. If the lamp does not light properly, see [The FDD Activity Indicator Does Not Light](#) on page 159.
- 9 Make sure that the status indicators on each hard disk drive and/or SCSI device light correctly.
- 10 If RAID controllers are installed in the server, perform RAID configuration damage checks using the POST. When the server starts, the monitor displays the prompt appropriate for the operating system. If the prompt does not appear on screen, see [Startup Problems](#) on page 156.

Startup Sequence

This section addresses problems which may occur during startup.

Error Checking

When the server starts, the POST executes and checks the motherboard, the memory, the keyboard, and other devices. If the POST detects an error, it displays an error message on the screen. An alarm sounds (beeps) continuously if the error was detected prior to displaying the POST window.

Startup Problems

If an error occurs during the server startup, check the following:

- ❖ Is the power cable connected correctly to an appropriately grounded AC power outlet?
- ❖ After pressing the Power button, did the power on indicator turn green?
- ❖ Are all cables connected correctly and securely?
- ❖ Are the PCI expansion cards installed correctly?

- ❖ Are all switch settings, including jumper settings, for the expansion cards and peripheral devices set correctly? Refer to the user(s) guide(s) for the expansion card(s) and peripheral devices for more information.
- ❖ Are the hard disk drives connected correctly?
- ❖ Are the format and settings for any added hard disk drives correct?
- ❖ Are the device drivers installed correctly?
- ❖ Are the environmental conditions appropriate for the server (ambient temperature, relative humidity)?
- ❖ Is the operating system loaded correctly and in normal operation?
- ❖ Is the rack's KVM switchbox set to select the server?

Application Software Problems

In general, if you have any problems with application software, check the following:

- ❖ Does the system meet the minimum hardware requirements for the software? See the software documentation.
- ❖ Is the software an authorized copy? Unauthorized copies often do not work. Refer to the software operating manual.
- ❖ If you are running the software from a diskette, is it a good copy?
- ❖ If you are running the software from a CD-ROM, is the disc scratched or dirty?
- ❖ If you are running the software from a hard disk drive, is the software correctly installed? Were all necessary procedures followed and files installed?
- ❖ Is the software set up correctly?
- ❖ Is the software being used correctly?
- ❖ Are the correct device drivers installed?
- ❖ Is the software correctly configured for the system?
- ❖ Are you using the software correctly?

If you are unable to resolve the problem, contact the software manufacturer's technical support representative.

After the System Has Been Running Correctly

Once the software has been running successfully, if a problem arises that you suspect is a software problem, check the following:

- ❖ Are you running the software from a diskette? Try a different diskette to determine if the problem still occurs.
- ❖ Are you running the software from a CD-ROM? Try a different disc to see if the problem still occurs.
- ❖ Are you running the software from a hard disk drive? Try running it from a diskette. If the software runs correctly, there may be a problem with the hard disk drive or the recorded data files. Try reinstalling the software on the hard disk.
- ❖ Have you installed all of the necessary files?
- ❖ Are the problems you are experiencing intermittent? There may be a loose cable, a marginal power supply, dirt in the keyboard (if keyboard input is incorrect), or some other random component failure.
- ❖ Do you suspect that a transient voltage spike occurred, or did you experience a power outage, or brownout? Reload the software and try running it again. (Symptoms of voltage spikes include a flickering video display, unexpected system reboots, and the system not responding to user commands.)



NOTE: If you are getting random errors in your data files, they may be getting corrupted by voltage spikes on your power line. If you are experiencing any of the above symptoms that might indicate voltage spikes on the power line, install a surge suppressor between the power outlet and the system power cord.

Common Hardware Problems

This section lists some common problems and their solutions. If you are unable to resolve the problem, contact an authorized Toshiba Magnia service provider or your sales office.

The Power Indicator Does Not Light

- ❖ Is the server connected to an appropriately grounded AC power outlet?
- ❖ Is the indicator on the Power Supply unit on? Is the server operating normally? If so, the power indicator is probably faulty.

The Screen is Blank

- ❖ Is the keyboard connected correctly?
- ❖ Is the keyboard functioning correctly? If the keyboard is locked, restart the system.
- ❖ Are the monitor's signal and power cables connected correctly?
- ❖ Is the monitor turned on?
- ❖ Are the monitor's brightness and contrast levels set correctly?
- ❖ Are the monitor's switches set correctly?
- ❖ Is the onboard video controller enabled?
- ❖ Is the system in secure mode?
- ❖ When Windows NT is used, is the screen resolution and synchronization frequency supported by the monitor? Start the server in VGA mode to check for normal operation.
- ❖ Is the KVM switchbox set to select the server?

Characters are Distorted or Do Not Display Properly

- ❖ Is the monitor adjusted to appropriate brightness and contrast levels? Refer to the monitor manual.
- ❖ Are the monitor's signal and power cables correctly installed?
- ❖ When Windows NT is used, is the screen resolution and synchronization frequency supported by the monitor? Start the server in VGA mode to check for normal operation.

The FDD Activity Indicator Does Not Light

- ❖ Are the floppy disk drive's signal and power cables connected correctly?
- ❖ Are all relevant switches and jumpers on the floppy disk drive set correctly?
- ❖ Is the floppy disk drive configured correctly?



NOTE: When you are using the onboard diskette controller, you must use the BIOS Setup menu to make sure that **Onboard Floppy** is set to Enabled.

The FDD Activity Indicator is Always On

- ❖ Is the floppy disk drive's signal cable connected correctly?

The HDD Status Indicators Do Not Light

- ❖ Is the power connector for the hard disk drive(s) connected?
- ❖ Is the SCSI cable connected correctly to the SCSI controller?
- ❖ Are the hard disk drives mounted correctly?
- ❖ Is the hard disk drive configured correctly?
- ❖ If you are using RAID controllers, is the RAID configuration set correctly?



NOTE: The front panel hard disk LED indicates IDE and SCSI device activity. This LED does **NOT** display CD-ROM activity.

The HDD Does Not Respond

As a system requirement, internal hard disk drives are not started at power up. Problems may arise if a third-party SCSI controller fails to send a *Start Unit* command during the SCSI ROM boot. Therefore, SCSI BIOS defaults must be set to start all hard disk drives during ROM load. **This modification is required for all Adaptec RAID controllers.** To configure the SCSI BIOS, refer to the RAID controller user guide.

CD-ROM Drive Status Indicator Does Not Light

- ❖ Are the CD-ROM drive's signal and power cables connected correctly?
- ❖ Are all relevant switches and jumpers on the CD-ROM drive set correctly?
- ❖ Is the CD-ROM drive configured correctly?
- ❖ Is the onboard IDE controller enabled?

Before Calling for Service

If you cannot solve the problem yourself, confirm and record the following information before contacting Toshiba Technical Support:

- ❖ Server model number and serial number (located on the rear of the server)
- ❖ List of hardware and software components installed in the server
- ❖ Brief statement of the problem
- ❖ How frequently the problem occurs

- ❖ Environment in which the problem occurred
- ❖ Method of simulating the problem

Toshiba Technical Support

If you need assistance:

- ❖ www.support.toshiba.com

Download the latest drivers, view detailed installation instructions, and access the latest server information.

- ❖ InTouchsm Center

Calling within the United States (800) 457-7777

Calling from outside the United States (949) 859-4273

Appendix A: Specifications

This appendix describes the Toshiba Magnia 3135R specifications and build-to-order (BTO) options available at the time this user's guide was published. The most current specifications and BTO options are available on the Toshiba America Information Systems' web site at www.support.toshiba.com.

The following information applies to the Toshiba Magnia 3135R unless otherwise stated.

Model specifications

PLATFORM	
SERIES NAME	MAGNIA 3135R
PART NUMBER	<i>As Listed:</i> See Configuration Page
PROCESSOR	
Processor Types	Intel Pentium III
Processor Socket Type	FC-PGA
Processor speeds	
Available processor speeds	733 MHz, 866 MHz, 1GHz
Integrated Coprocessor	Yes
Processor Cache (L1) Capacity	32KB
Bus Speed	133 MHz
LEVEL 2 (L2) CACHE	
Capacity	256KB
Cacheable Main Memory Area	2 GB
SYSTEM BOARD	
Form Factor	Server AT
Chipset	ServerWorks ServerSet III LE
Down Components	
I/O Controller	National PC97317VUL
Graphics Controller	ATI RAGE IIC
SCSI Controller	Adaptec AIC-7899
SYSTEM ARCHITECTURE	
PCI BUS: (V2.2): (32-Bit, 33 MHz, 64-Bit, 66 MHz)	
Intelligent I/O (I ₂ O)	
HARDWARE MONITORING (DMI ASIC)	BMC (Baseboard Management Controller)

MEMORY

Type	ECC Registered SDRAM
Available Standard Configurations	128 MB
Maximum	4.0 GB
ECC/Parity Support	ECC
Data Bus Width	72 bit (64 Bit-ECC) address width = 12 bit
Local Clock Bus Speed	133 MHz
Socket type (arranged in banks of 4)	168-pin DIMM

BIOS (1 MB FLASH EEPROM)

Standard features supported	Standard PCI-BIOS services, Plug and Play, DMI
Special features supported	Security, Multiple-speed processor support, SMP support, Fault resilient booting (FRB) Logging of critical events, Server management features, CMOS configuration RAM defaults, Multiple language support, Defective DIMM detection and re-mapping, Automatic detection of video adapters, PCI BIOS interface, Option ROM shadowing, System information reporting, ECC support, SMI support, User-supplied BIOS support, L2 cache support, IPmi support, Memory sizing, boot drive sequencing, resource allocation support

SERVER MANAGEMENT**SUPPORTED FUNCTIONS****EXTERNAL INTERFACES**

9-Pin Serial	Two
25-Pin Parallel	One
15-Pin RGB (SVGA video)	One
Mouse Port (PS/2)	One
104 Keyboard (PS/2)	One
USB port	Two
RJ-45 NIC connector	One
AC IN (Standard 3 prong)	One

VIDEO

Video Memory: SGRAM	4MB
Data Bus width	32 Bit
Speed	33 Mhz
Graphic Controller	
Local Bus support	No
Controller Chip	ATI RAGE IIC
Plug & Play compliant	Yes
BitBLT Engine	Yes

SUPPORTED VIDEO RESOLUTIONS

(Non-Interlaced unless otherwise specified)	Colors	Freq (Hz)
640x480	8bpp, 16bpp, 24bpp, 32bpp	60,72,75,85
800x600	8bpp, 16bpp, 24bpp, 32bpp	56,60,70,72,75,85
1024x768	8bpp, 16bpp, 24bpp, 32bpp	60,70,72,75,85
1152x864	8bpp, 16bpp, 24bpp, 32bpp	60,70,75,80,85
1280x1024	8bpp, 16bpp, 24bpp	60

INTERNAL SCSI CONTROLLER			
Chipset	Adaptec (AIC-7899)		
Channels	2 ch		
Local Bus support	Yes		
SCSI support	Ultra 160/ultra wide SCSI		
SCSI Data Transfer Rate	160 MB/s		
On PCI	133 MB/s		
SCSI Channel	160 MB/s		
ETHERNET SUPPORT			
Chipset	Intel 82559		
Support Network	100 Base-TX/10 BaseT		
AFT/ALB Support	Yes		
Wake-On-LAN™ Support	Yes		
Port	RJ45		
EXPANSION BAY	TOTAL	AVAILABLE	CONFIGURED
Internal			
3.5"	0	4	0
5.25"	0	0	0
Hot Swappable Front Access HDD Bays			
EXPANSION SLOTS	TOTAL	AVAILABLE	CONFIGURED
PCI: Full-Length/Half-Length	2/0	2	0
ISA: Full-Length	0	0	0
PCI/ISA Shared: Full-Length	0	0	0
POWER SUPPLY (275 W)			
Input (Voltage/Frequency)	100 - 240V 50/60 Hz		
Hot pluggable/Hot Spare	No		
Lockable	No		
Load sharing	No		
Redundant Power supply option	No support		
Standard			
Maximum			
SUPPORTED SAFETY STANDARDS			
US/Canada	UL, CSA, EMI FCC Part 15, Class B		
Europe	EN 60950, CE Mark, EU 60950 2nd Ed, +A1, +A2, +A3, +A11		
COOLING FANS			
Standard	5 (with processor fans)		
Variable Speed Fan Control	No		
Redundant Option	No		
SECURITY			
Hardware	No		
Password Support	Yes		
Keyboard/Mouse Lock	No		
Miscellaneous	No		
DIMENSIONS			
Measurements	3.46" (88mm) H x 18.90" (435mm) W x 24.10" (575mm)		
Weight	55 lbs. (21Kg)		

CERTIFIED SOFTWARE:

BUNDLED SOFTWARE: Red Hat Linux

COMPLIANCE

EMC-emission:	EN50081-1	1992	Residential, commercial & Light Industry Class B (Domestic environment) 230V/AC, 50Hz 230V/AC, 50Hz
	EN55022	1994	
	EN61000-3-2	1995	
	EN61000-3-3	1995	
EMC-immunity:	EN55024	1998	Residential, commercial & Light Industry DO:8kV, AD:15kV 3V/m, 80-1000MHz, 1kHz 80% AM AC-line: 1kV, Signal-line: 0.5kV, f:5kHz, Polarity: +/- AC-line: 1kV/2kV, Polarity: +/- 3Ve.m.f, 0.15-80MHz, 80% AM 30% 500ms, 100% 10ms, >95% 5000ms
	EN61000-4-2	1995	
	EN61000-4-3	1998	
	EN61000-4-4	1995	
	EN61000-4-5	1995	
	EN61000-4-6	1997	
	EN61000-4-11	1994	
Safety:	EN60950	1992	
	A1	1993	
	A2	1993	
	A3	1995	
	A4	1997	
	A11	1997	

WARRANTYStandard 3 year parts and labor on site, next day delivery

ENVIRONMENTAL SPECIFICATIONS

Temperature:	41° - 89° F (15° - 32° C)
Relative Humidity:	30% - 80% Rh

COMPONENT	
STORAGE	
FDD	720 KB / 1.44 MB
Form Factor	3.5"
Height	1"
HDD Options (9.0 GB)	
Part Number	DDYS-T09170M (10,000 rpm)
Form Factor	3.5"
Height	1"
Interface (All Models)	Fast-Wide SCSI1, Ultra-Wide SCSI, Ultra2-Wide SCSI, Ultra160 SCSI
Buffer	4096 KB
Hot swappable	Yes
Certifications	SMART, SCA2
HDD Options (18 GB)	
Part Number	DDYS-T18350M (10,000 rpm)
Form Factor	3.5"
Height	1"
Interface (All Models)	Fast-Wide SCSI1, Ultra-Wide SCSI, Ultra2-Wide SCSI, Ultra160 SCSI
Buffer	4096 KB
Hot swappable	Yes
Certifications	SMART, SCA2
HDD Options (36 GB)	
Part Number	DDYS-T36950M (10,000 rpm)
Form Factor	3.5"
Height	1"
Interface (All Models)	Fast-Wide SCSI1, Ultra-Wide SCSI, Ultra2-Wide SCSI, Ultra160 SCSI
Buffer	4096 KB
Hot swappable	Yes
Certifications	SMART, SCA2

RAID Controller Options	
Toshiba Part Number	
Processor type	Intel i960RP 32bit RISC Processor 100 MHz
I ₂ O Ready	
Local Bus support	
Burst Data Transfer Rate	PCI V2.2 Bus Master with Burst Data Transfer rate of 132 MB/sec
Standard cache	32 MB
Memory Type	168 pin Industry Standard DIMMs
Memory slots	1
Tone generator and speaker	Down (for system error warnings)
Size	Half-length PCI footprint (6.875" x 4.2")
SCSI specifications	
SCSI Controller	Qlogic ISP10160A
SCSI support	Fast/Wide SCSI2, Ultra2/Wide SCSI, Ultra160 SCSI
Data Transfer (SCSI channel)	Max 160 MB/sec
SCSI Bus	
	SE(Single Ended) SCSI Bus with Active Termination LVD (Low Voltage Differential) SCSI Bus with Active Termination (Multi Mode)
Devices per channel (max)	Up to 15 wide type Devices or Up to 7 Fast type Devices
SCSI channels	1
RAID levels supported	0, 1, 5, 10, and 50
SCSI connector	68 pin Internal High Density Connector for 16 bit Devices: 1 ch: 1 68 pin External Ultra High Density Connector for 8 or 16 bit Devices: 1 ch: 1
Multi-threading	Multi-Threading of up to 255 Commands Simultaneously
Physical drive support	Max 8 Physical Drives per 1 Physical Array
Logical drive support	8 Logical Drives per MegaRAID Controller*
Fault Tolerance	*In the case of RAID 10 or 50, Logical Drives is spanning RAID 1 or 5
Fault Bus support	Yes (SAF-TE)
Auto Detection of Failed HDD	Yes
Rebuild	Multiple Rebuilds and Consistency Checks with Transparent and User Definable Priority
Hot spare support	Yes
Serial interface	1 (9 pin, RS-232C Compliant)
CD-ROM	
Type	Internal
CD-ROM speed	24X
Interface	EIDE/ATAPI
Buffer	128 KB
Random Access Time	110 ms
Sustained Data Transfer Rate	3,600 KB/sec
Supported Disk Formats	CD-R/RW, CD-DA, CD-ROM/XA, Video-CD, CD-I, Multisession Photo CD, CD-EXTRA

KEYBOARD	<u>Rack Keyboard Option</u>
95-key keyboard	No
Windows 95 support	No
3.5mm Travel	No
12 dedicated function keys	No
Numeric keypad	No
Keyboard tilt	No
Scroll Lock, CapsLock, NumLock	No
Indicators	No
POINTING DEVICE	(on keyboard)
PS/2 Trackball	Yes: 2 button with 6' cable

Interrupt levels

IRQ	Device
0	Interval timer
1	Keyboard buffer full
2	Cascade interrupt from slave PIC
3	Onboard serial port B (COM2) - Only for "Enabled"
4	Onboard serial port A (COM1) - Only for "Enabled"
5	Onboard network adapter, USB
6	Onboard floppy disk controller
7	Parallel port LPT1 (Only for "Enabled")
8	Real-time clock (RTC)
9	ACPI
10	Usable (may be used by the on-board SCSI controller, if RAID controller is mounted.)
11	Onboard SCSI controller (or RAID controller if mounted)
12	Onboard PS/2 mouse port
13	Math coprocessor
14	IDE controller
15	Usable (may be used by the on-board SCSI controller, if RAID controller is mounted.)

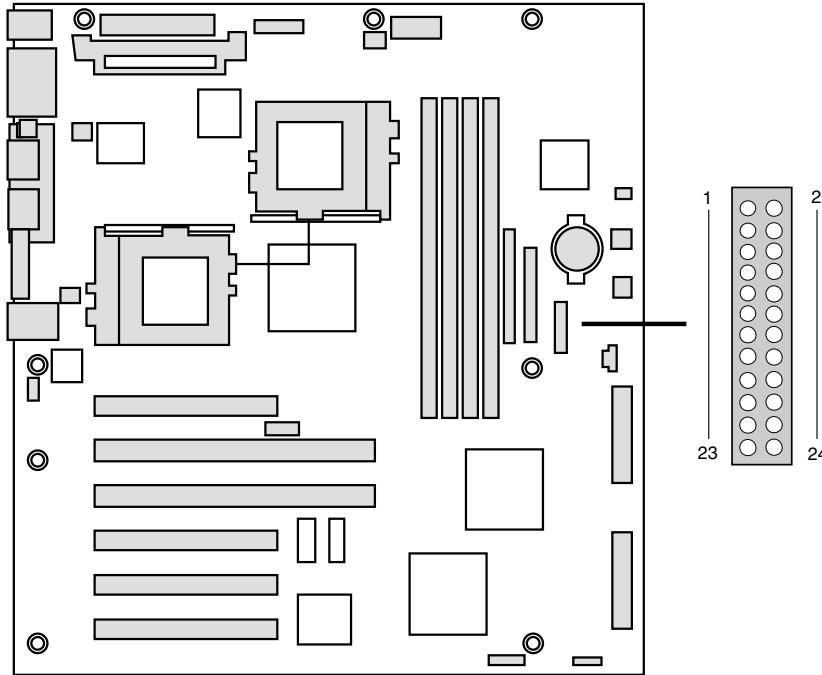
Assigning PCI device IDs

During setup of PCI expansion cards and system setup of each onboard PCI device, you will want to assign a unique device number to distinguish between devices that share the same name. The following table provides a list of available PCI slots, and device numbers of the onboard devices.

Slot	Bus number	Device number
Onboard SCSI controller	0	C
Onboard network adapter	0	E
PCI-5 (on riser)	A ¹	4

¹ The bus number changes to 2 or 3 depending on the device connected to the PCI bus 0.

Appendix B: Interface



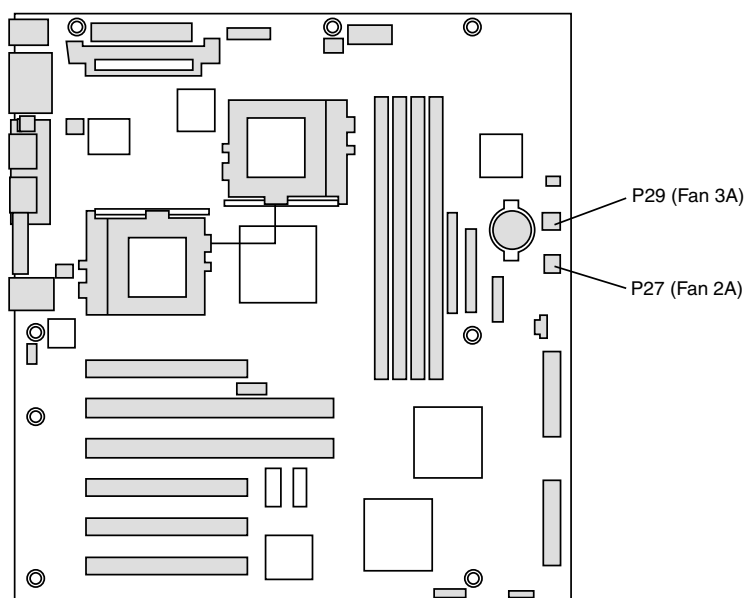
STL2 Server Board

Pin	Signal	Pin	Signal
1	Power LED Anode	13	Power Switch (GND)
2	Reserved	14	NIC Activity LED Cathode
3	Key	15	Reset Switch (Low True)
4	Fan Fault LED Anode	16	Reserved
5	Power LED Cathode	17	Reset Switch (GND)
6	Fan Fault LED Cathode	18	Reserved
7	Hard Drive Activity LED Anode	19	ACPI Sleep Switch (Low True)
8	Power Fault LED Anode	20	Chassis Intrusion
9	Hard Drive Activity LED Cathode	21	ACPI Sleep Switch (GND)
10	Power Fault LED Cathode	22	Reserved
11	Power Switch (Low True)	23	NMI to CPU Switch (Low True)
12	NIC Activity LED Anode	24	Reserved

Main Power Connector

Pin	Signal	Pin	Signal
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	COM	15	COM
4	+5V	16	PS_ON
5	COM	17	COM
6	+5V	18	COM
7	COM	19	COM
8	PWR_OK	20	-5V
9	+5VSB	21	+5V
10	+12V	22	+5V
12	+3.3V	24	COM

Fan Interface



Fan connectors

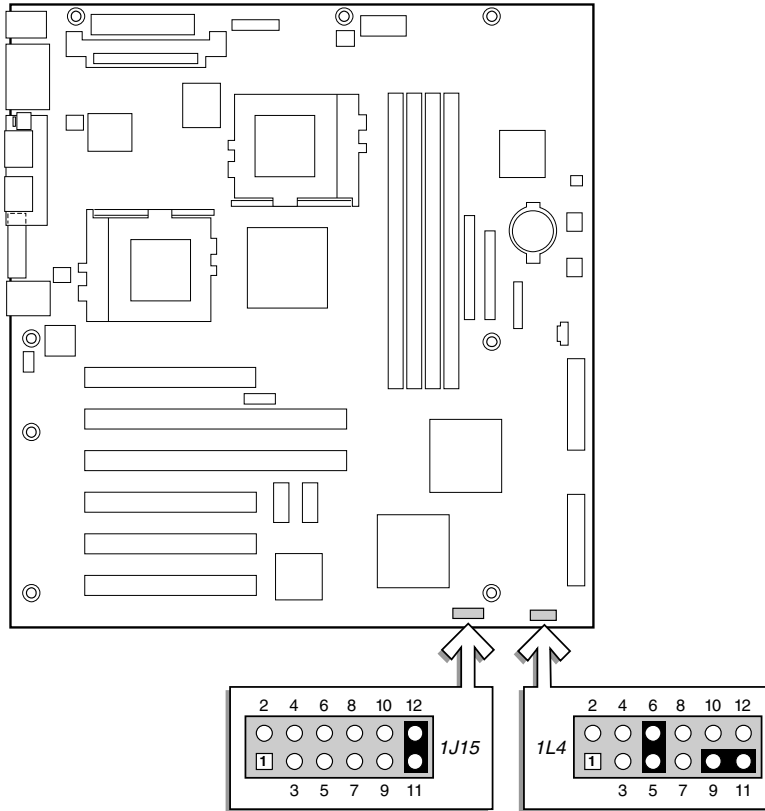
The server board has five 3-pin fan connectors that are shrouded and keyed. Two are located next to the processor sockets (one for each processor). Each is intended to be used for a tachometer fan heat sink.



CAUTION: Fan connectors 2A and 2B can not be used simultaneously. If you plug fans into both connectors, the fans will not operate correctly.

Pin	Signal
1	GND
2	+12V
3	Fan sensor

Appendix C: Jumper Settings



Jumper Locations

Jumper Name	Pins (default in bold)	What it Does at System Reset
Jumper (1J15)		
CMOS Clear	1-2	If jumpered, the CMOS settings will be cleared on the next reset. These pins should not be jumpered for normal operation.
Password Disable	3-4	If jumpered, the password will be cleared on the next reset. These pins should not be jumpered for normal operation.
Reserved	5-6	Reserved. These pins should not be jumpered for normal operation.
Reserved	7-8	Reserved. These pins should not be jumpered for normal operation.
Reserved	9-10	If these pins are jumpered, the system will attempt BIOS recovery. These pins should not be jumpered for normal operation.
Reserved	11-12	Reserved. These pins should be jumpered for normal operation.
Jumper (1L4)		
FRB3	1-2	If these pins are jumpered, FRB is disabled.
Front Cover Chassis Intrusion Sensor	3-4	This is an alternate connector for the chassis intrusion switch. The preferred connector are pins 1-2 on block 6A.
Reserved	5-6	Reserved. These pins should be jumpered for normal operation.
Reserved	7-8	Reserved. These pins should not be jumpered for normal operation.
Reserved	9-10	Reserved. These pins should not be jumpered for normal operation.
Reserved	11-12	Reserved. These pins should not be jumpered for normal operation. Pins 9-11 should be jumpered for normal operation.

General Procedure to Change Jumper Setting

The following short procedure for changing a configuration setting is the same for most of the jumper functions:

- 1 Observe the safety and ESD precautions at the beginning of this manual.
- 2 Turn off all connected peripherals, turn off system power, and disconnect the AC power cord.
- 3 Remove the cover. You do not need to remove the server board from the chassis, and you probably do not need to remove any add-in boards.
- 4 Locate the configuration jumpers at the edge of the server board toward the front of the system.
- 5 Move the jumper to pins specified for the desired setting.
- 6 Reinstall the cover, connect the power cord, and turn on the system for the change to take effect.
- 7 You may need to repeat these steps to move the jumper back to its original setting, depending on the jumper function.

CMOS Jumper

The jumper at pins 1 and 2 controls whether settings stored in CMOS nonvolatile memory (NVRAM) are retained during a system reset.

Use the following procedure to restore the system's CMOS and RTC to default values:

- 1 See "General Procedure to Change Jumper Setting" above.
- 2 Short the CMOS jumper on 1 and 2 (the Clear CMOS memory position).
- 3 Reinstall the cover for your safety and connect the power cord to the system.
- 4 Turn the system on. Wait for POST to complete and for the messages "NVRAM cleared by jumper" and "Press F2 to enter Setup" to appear. This automatically reprograms CMOS and RTC to their default settings.
- 5 Enter Setup and make any changes necessary (for example, changing the boot device). Press F10 to save the new Setup configuration and exit Setup.
- 6 Turn the system off and disconnect the power cord from the system.
- 7 Remove the cover.
- 8 Remove the jumper from pin 1 and 2 (the Protect CMOS memory position).
- 9 Reinstall the cover and connect the power cord to the system.

- 10 Run the BIOS Setup to verify the correct settings (see Chapter 3).

Password Jumper

The jumper at pins 3 and 4 controls whether the user and administrative passwords are retained or cleared during a system reset.

Use the following procedure to clear the current password and then enter a new one:

- 1 See “General Procedure to Change Jumper Setting” above.
- 2 Short the Password jumper on 3 and 4.
- 3 Reinstall the cover for your safety and connect the power cord to the system.
- 4 Turn the system on and wait for POST to complete. This automatically clears the password.
- 5 Turn off the system and disconnect the power cord.
- 6 Remove the cover.
- 7 Remove the jumper from pin 3 and 4.
- 8 Reinstall the cover and connect the power cord to the system.

FRB Timer Enable Jumper

The jumper at pins 1 and 2 controls the FRB timers.

Use the following procedure to disable the FRB timer:

- 1 See “General Procedure to Change Jumper Setting” above.
- 2 Remove the cover.
- 3 If the FRB Timer enable jumper is shorted on Pin 1 and 2, the FRB timer is disabled.
- 4 Reinstall the cover for your safety and connect the power cord to the system.
- 5 Turn the system on and wait for POST to complete.

Chassis Intrusion Detection Jumper

The chassis contains an alarm switch that sends a notification signal to the server management software if a cover is removed.

Use the following procedure to connect the chassis:

- 1 See “General Procedure to Change Jumper Setting” above.
- 2 Remove the cover.

- 3** Connect the chassis intrusion switch cable to Pin 3-4 of connector 1L4(G) on the server board.
- 4** Reinstall the cover for your safety and connect the power cord to the system.
- 5** Turn the system on and wait for POST to complete.

Appendix D: Unit Logs

Basic System Configuration

Item	Maker/Model No./Type No.	Serial Number	Date installed
System			
Server board			
Primary processor speed and cache			
Secondary processor speed and cache			
Video display			
Keyboard			
Mouse			
Diskette Drive A			
CD-ROM drive			
Hard disk drive 1			
Hard disk drive 2			
Hard disk drive 3			
Hard disk drive 4			
RAID			
NIC			

Current Usage

Do not exceed a combined power output of 167 watts for the +5 and +3.3-volt outputs.

The PCI slots on the server board are rated at a maximum of 5 amperes per slot. The maximum power allowed for each slot is 20 watts at +5 volts. The average current usage per slot should not exceed 3.0 amperes per slot (that is 15 watts).

The cooling efficiency varies per slot; therefore, ensure that adequate cooling is available in the target slot, especially in an expansion slot drawing more than 2.0 amperes.

Calculating Power Consumption

The total combined wattage for the system configuration must be less than the output of the power supply. Use the two worksheets in this section to calculate the power used by the server boards. For current and voltage requirements for add-in boards and peripherals, see your vendor documents.

Worksheet for Calculating DC Power Usage

- 1 List the current for each board and device in the appropriate voltage level column.
- 2 Add the currents in each column then go to the next worksheet.

	Current (Maximum) at Voltage Level:				
Device	+3.3 V	+5 V	−5 V	+12 V	−12 V
Server board	1.0 A	8.0 A	0.1 A	1.1 A	0.4 A
Primary processor					
Secondary processor (if present)					
Terminator card, if no second processor	1.6 A				
Memory (four 128-MB DIMMs)	1.8 A	0.3 A			
PCI slot 1					
PCI slot 2					
1st 3.5-inch hard disk drive					
2nd 3.5-inch hard disk drive					
3rd 3.5-inch hard disk drive					
4th 3.5-inch hard disk drive					
	Current (Maximum) at Voltage Level:				
3.5-inch diskette drive					
CD-ROM drive					
Cooling fan 1				.300	

Cooling fan 2				.300	
Total current					

Worksheet for Calculating Total Combined Power

- 1 From the previous worksheet, enter the total current for each column.
- 2 Multiply the voltage by the total current to get the total wattage for each voltage level.
- 3 Add the total wattage for each voltage level to arrive at a total combined power usage on the power supply.

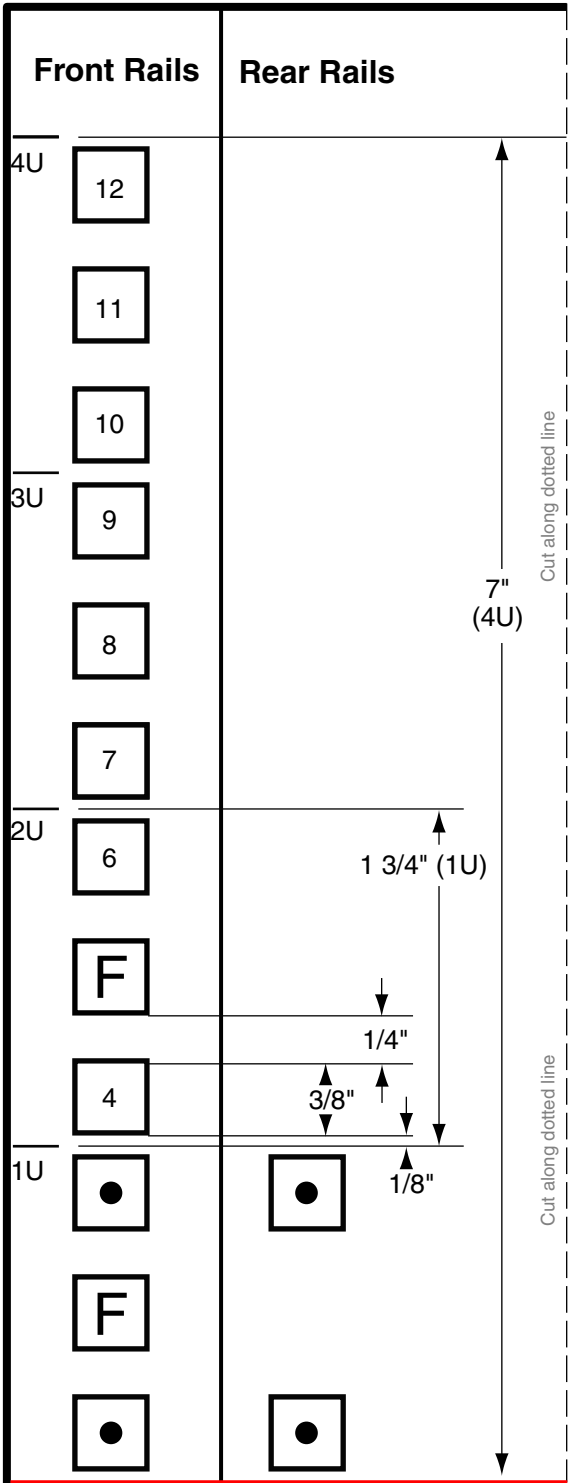
Voltage Level and Total Current (V X A = W)	Total Watts for Each Voltage Level
(+3.3 V) X (_____ A)	_____ W
(+5 V) X (_____ A)	_____ W
(-5 V) X (_____ A)	_____ W
(+12 V) X (_____ A)	_____ W
(-12 V) X (_____ A)	_____ W
Total combined wattage	_____ W

Appendix E: Rack Template

Using the Template

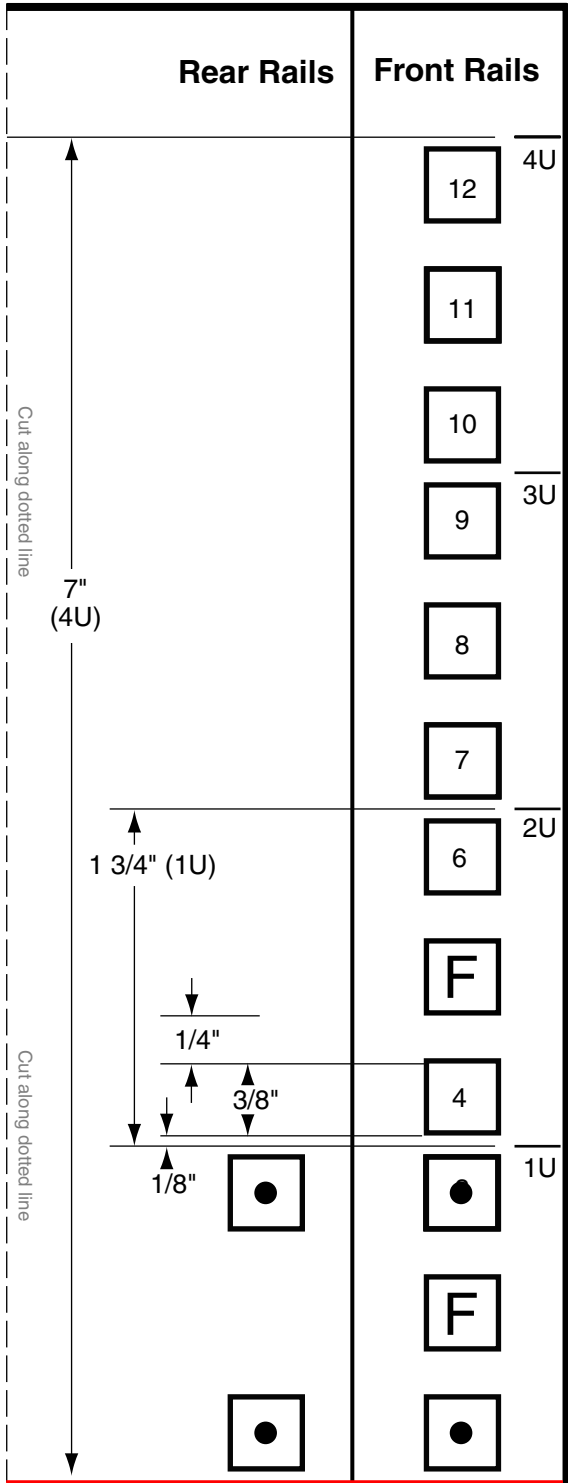
To use this template, simply print out the template page, but be sure **not** to use the Acrobat option of "shrink to page" when printing. This template needs to be printed at the actual size that it is in this guide.

The Rack Template may be found on the following page.



● Rail Screw

F Front Panel Screw



Glossary



TECHNICAL NOTE: Some features defined in this glossary may not be available on your computer.

Acronyms

<i>A:</i>	Amps
<i>AC:</i>	Alternating Current
<i>ACPI:</i>	Advanced Configuration Power Interface
<i>AFT:</i>	Adapter Fault Tolerance
<i>ALB:</i>	Adapter Load Balancing
<i>ANSI:</i>	American National Standards Institute
<i>APM:</i>	Advanced Power Management
<i>ASCII:</i>	American Standard Code for Information Interchange
<i>ASD:</i>	Automatic Shutdown
<i>ATAPI:</i>	Advanced Technology Attachment Packet Interface
<i>AVI:</i>	Audio Video Interleaved
<i>BIOS:</i>	Basic Input/Output System
<i>BPS:</i>	Bits per Second
<i>CD-ROM:</i>	Compact Disc Read-Only Memory
<i>CFG:</i>	Configuration
<i>CHS:</i>	Cylinder Head Sector
<i>CMOS:</i>	Complementary Metal-Oxide Semiconductor
<i>COM1:</i>	Communications Port 1 (serial port)

<i>COM2:</i>	Communications Port 2 (serial port)
<i>CPS:</i>	Characters Per Second
<i>CPU:</i>	Central Processing Unit
<i>CRC:</i>	Cyclic Redundancy Check
<i>CRT:</i>	Cathode Ray Tube
<i>CTS:</i>	Clear To Send
<i>DC:</i>	Direct Current
<i>DCD:</i>	Data Carrier Detect
<i>DDS:</i>	Disk Drive Subsystem
<i>DIMM:</i>	Dual Inline Memory Module
<i>DIP:</i>	Dual In-line Package
<i>DMA:</i>	Direct Memory Access
<i>DOS:</i>	Disk Operating System
<i>DPI:</i>	Dots per Inch
<i>DPMS:</i>	Display Power Management Support
<i>DRAM:</i>	Dynamic Random Access Memory
<i>DSP:</i>	Digital Signal Processor
<i>DSR:</i>	Data Set Ready
<i>DTR:</i>	Data Terminal Ready
<i>DVD:</i>	Digital Versatile Disc
<i>ECC:</i>	Error-Correcting Code
<i>ECP:</i>	Enhanced Capabilities Port
<i>EEPROM:</i>	Electrically Erasable Programmable Read Only Memory

EDO RAM: Enhanced Data Output Random Access Memory

EIDE: Enhanced Integrated Drive Electronics

EISA: Extended Industry Standard Architecture

EMP: Emergency Management Port

EPP: Enhanced Parallel Port

ESCD: Extended System Configuration Data

ESD: Electrostatic Discharge

FAT: File Allocation Table

FCC: Federal Communications Commission

FDC: Floppy Disk Controller

FIR: Fast Infrared

FPS: Frames per Second

FTP: File Transfer Protocol

GB: Gigabyte

GND: Ground

GUI: Graphical User Interface

HDD: Hard Disk Drive

HTML: HyperText Markup Language

Hz: Hertz

IEEE: Institute of Electrical and Electronic Engineers

I₂O: Intelligent Input/Output

I/O: Input/Output

IR: Infrared

<i>IrDA:</i>	Infrared Data Association
<i>IRQ:</i>	Interrupt Request
<i>ISA:</i>	Industry Standard Architecture
<i>ISDN:</i>	Integrated Services Digital Network
<i>KB:</i>	Kilobyte
<i>KBD:</i>	Keyboard
<i>Kbps:</i>	Kilobits per second
<i>LAN:</i>	Local Area Network
<i>LBA:</i>	Logical Block Addressing
<i>LCD:</i>	Liquid Crystal Display
<i>LDSM:</i>	LAN Desk Server Manager
<i>LED:</i>	Light-Emitting Diode
<i>LFB:</i>	Linear Frame Buffer
<i>LPT1:</i>	Line Printer Port 1 (parallel port)
<i>LSI:</i>	Large Scale Integration
<i>MB:</i>	Megabyte
<i>Mbps:</i>	Megabits per second
<i>MIDI:</i>	Musical Instrument Digital Interface
<i>MIPS:</i>	Millions of Instructions Per Second
<i>MMX:</i>	Multimedia Extensions
<i>MO:</i>	Magneto-Optical
<i>MPEG:</i>	Movie Pictures Expert Group
<i>MPU:</i>	Microprocessor Unit

MS-DOS: Microsoft Disk Operating System

NIC: Network Interface Controller

NLM: Network Loadable Module

NMI: Non-Maskable Interrupt

NPX: Numerical Processor eXtension

PCI: Peripheral Component Interconnect

PIO: Programmed Input/Output

POST: Power-On Self Test

PnP: Plug and Play

P-P: Peak to Peak

RAID: Redundant Array of Independent Disks

RAM: Random Access Memory

RFI: Radio Frequency Interference

RGB: Red, Green, Blue

ROM: Read-Only Memory

RTC: Real-Time Clock

RTS: Request To Send

RXD: Received Data

SCSI: Small Computer Systems Interface

SDRAM: Synchronous Dynamic Random Access Memory

SEL: System Event Log

SIMM: Single Inline Memory Module

SMC: System Management Card

<i>SMP:</i>	Symmetric Multiprocessing
<i>SPB:</i>	Synchronous Pipeline Burst (cache)
<i>SST:</i>	Server Setup Tool
<i>SSU:</i>	System Setup Utility
<i>SVGA:</i>	Super Video Graphics Adapter
<i>TSR:</i>	Terminate and Stay Resident
<i>TXD:</i>	Transmitted Data
<i>UART:</i>	Universal Asynchronous Receiver/Transmitter
<i>URL:</i>	Universal Resource Locator
<i>UPS:</i>	Uninterruptable Power Supply
<i>USB:</i>	Universal Serial Bus
<i>V:</i>	Volts
<i>VRM:</i>	Voltage Regulator Module
<i>VGA:</i>	Video Graphics Adapter
<i>VRAM:</i>	Video Random Access Memory
<i>WAN:</i>	Wide Area Network
<i>WOL:</i>	Wake on LAN
<i>WWW:</i>	World Wide Web

A

adapter: A device that provides a compatible connection between two units. For example, the computer's built-in display adapter takes information from the computer and translates it into images on the screen. An adapter can take a number of forms, from a microprocessor to a simple connector. An intelligent adapter (one that is capable of doing some processing) may also be called a controller.

address: 1) A number that identifies the location of information, such as the name of a file or a value for processing, in a computer system or network. A device may use a specific memory address to transfer information to and from the computer. See also *hexadecimal*. 2) A series of characters that identifies the location of a user's electronic mailbox.

Advanced Power Management: An industry standard for monitoring and conserving power consumption, particularly on battery-operated portable computers.

Advanced SCSI Programming Interface (ASPI): A standard governing how devices on multiple SCSI channels interact with each other and with the rest of the system.

allocate: To assign space or resources for a specific task. This is often used to refer to memory or disk space.

alphanumeric: Consisting of numbers, symbols and letters you can type or print.

alternating current (AC): Electric current that reverses its direction at regular intervals. This type of power is usually supplied to residential and commercial wall outlets.

American National Standards Institute (ANSI) character set: The set of characters available in Microsoft Windows (or other operating systems). The character set includes letters, numbers, symbols and foreign language characters.

American Standard Code for Information Interchange (ASCII): A set of binary codes that represent the most commonly used letters, numbers and symbols. The standard ASCII set consists of 128 codes (for 7-bit characters). Most PCs use an extended set of 256 codes (for 8-bit characters). See also *binary*.

analog: A continuous electrical signal that can vary in frequency and amplitude. In video, frequency corresponds to resolution and amplitude to brightness. In sound, frequency is a measure of pitch and amplitude and represents volume. Analog data must be converted to digital data for input to computers.

animation: A technique of imparting motion to items, either drawings or inert objects.

application: A computer program that you use to perform tasks of a specific type. Applications include word processors, spreadsheets and database management systems. See also *program*.

array: 1) A table of values that a program treats as a single unit. 2) A set of hard disk drives that are linked together to provide a very large amount of data storage.

asynchronous: A type of data transmission in which information is sent at variable time intervals. To indicate when a transmitted character begins and ends, it is preceded by a start bit and followed by an optional parity bit and one or two stop bits. See also *synchronous*.

audio: Audio (sound) frequencies for multimedia systems range from 15 Hz to 20,000 Hz. Audio includes voice, music, sound effects, and ambient sound.

audio mixing: Creating a custom audio track from several different sources using a sound-mixing device.

audio stream: Frames of compressed audio.

authoring: The process of writing, editing, and assembling a multimedia program on a personal computer using a multimedia authoring program.

authoring program: A software development environment used to create multimedia applications that reduce complex instructions to simple user tasks such as menu selection, mouse manipulation or typing. Such programs enable communicators to develop interactive courseware or presentations on personal computers without extensive programming knowledge.

AUTOEXEC.BAT: A batch file containing MS-DOS commands that the computer performs every time you start or restart it. For example, it contains commands that load the Windows operating system. See also *batch file*.

AVI (Audio Video Interleaved): Microsoft Corporation's trade name for synchronization and digital compression of video and audio signals.

B

backup: A copy of a file, usually on removable disk or tape, kept in case the original is lost or damaged. It's a good idea to keep backup copies of all your important files.

bandwidth: The amount of data that can be transmitted per second over a communications channel. Bandwidth is measured in bits per second (bps) for digital devices and in cycles per second (cps) for analog devices.

base memory: See *conventional memory*.

basic input/output system (BIOS): A set of basic computer instructions in read-only memory (ROM). The CPU's BIOS contains the information the computer needs to perform such tasks as determining the amount of memory, checking for the presence of devices, and loading the operating system. Some system components have their own BIOS.

batch file: A file, ending with a .BAT extension, containing MS-DOS commands that you can perform together, rather than typing them one at a time. Batch files are useful if you have a series of MS-DOS commands that you need to type fairly often. For example, you could use a batch file for the commands needed to log on to a network. See also *AUTOEXEC.BAT*.

baud (baud rate): The speed at which communications devices such as printers, terminals, and modems transmit information. Information travels as a series of electronic signals. The baud rate measures the rate of change in these signals. This is not necessarily the same as bits per second, although the two are related. It is named for Emil Baudot, a pioneer in printing telegraphy. See also *bits per second*.

binary: The base-two number system, in which the only digits are 0 and 1. This system is used in computers since it can be implemented as a series of electronic signals that are either off (0) or on (1). From right to left, the digits in a binary number have the values 1 2 4 8 16 and so on. For example, the binary number 101 is equivalent to the decimal number 5. If you need to convert numbers from binary to decimal or vice versa, many pocket calculators and calculation programs can do the work for you. See also *decimal*.

bit: A binary digit. The basic unit of information used by the computer, a bit may be either 1 or 0. While an individual bit cannot contain a significant amount of information, by combining bits into larger units, such as bytes (a group of eight connected bits), your computer can deal with huge blocks of data. See also *byte*.

bitmap: A graphic composed of dots or pixels. It is usually created by a drawing package, a screen capture utility or a scanner.

bits per second (BPS): A way of measuring the speed at which information is passed between two devices. This is the basic measure used in modem communications. This is similar, but not identical, to the baud rate. See also *baud*.

board: Short for printed circuit board. A thin card containing chips and other electronic components connected by metallic lines etched into the surface. Most of the basic components of a computer, such as the BIOS and memory are contained on one board, called the motherboard. A computer may contain additional boards, called daughterboards, that provide specific functions beyond those on the motherboard.

boot: To start the computer. There are two types of boot. Turning on the power is called a cold boot. Restarting the computer by pressing Ctrl + Alt + Del or the restart button is called a warm boot. The term boot originates from bootstrap program (as in pulling itself up by its bootstraps), a program that loads and initializes the operating system.

boot disk controller: The controller for the disk drive that the BIOS uses to load the operating system. By default, this is the controller for the primary floppy disk drive (A:). If you designate another disk drive as the boot drive, its controller becomes the boot disk controller.

boot priority (startup sequence): The order in which the computer searches its disk drives to locate the startup files. Under the standard boot priority, a computer looks for the startup files in the floppy disk drive before checking the primary hard disk.

briefcase: A Windows 95/98 and NT feature that allows you to update multiple versions of a file located on different computers.

buffer: An area of memory where information is held until it can be processed. Buffers are frequently used to compensate for the fact that some parts of the system are faster than others. For example, the computer sends information to a printer much faster than even the fastest printer can handle it. A print buffer stores printer information, enabling the computer to continue with other tasks. As the printer prints a page, it looks in the buffer to see what to do next.

bus: An electrical circuit that connects the microprocessor with other parts of the computer, such as the video adapter, disk drives and ports. It is the highway along which data flows from one device to another. See also *local bus*.

bus speed: The speed at which the central processing unit (CPU) communicates with the other elements of the computer. For example, the speed at which data moves between the CPU and the serial ports.

byte: A sequence of eight bits. A byte is the smallest addressable unit of data. Each byte represents an integer up to 255 in decimal (11111111 in binary, or FF in hexadecimal), or a character (such as a letter, numeral, or other symbol). See also *binary*, *bit*, *gigabyte*, *hexadecimal*, *kilobyte*, *megabyte*.

C

cache: An area of very fast memory in which frequently used or recently accessed information is duplicated for quick retrieval. Accessing data from cache is faster than accessing it from system RAM. See also *disk cache*.

cache buffer: A block of memory in a file server used as temporary storage for data being transferred to and from a workstation. File server performance is greatly increased with cache buffers which allow workstations to access data from memory rather than disk.

capacity: The amount of information that can be stored in a computer's memory or on a storage device such as a hard disk, diskette, or CD-ROM. Capacity is usually measured in terms of kilobytes (KB), megabytes (MB) or gigabytes (GB). See also *gigabyte*, *kilobyte*, *megabyte*.

CD (Compact Disc): Audio format in which sound is digitally encoded on a 12 cm disc. An optical laser encodes and decodes the digital data to produce exceptionally pure sound. It's durable, portable and has random access.

CD-ROM (Compact Disc Read Only Memory): A high-capacity (approximately 600 MB) storage medium that uses laser optics instead of magnetic means for reading data. The system can read data from these discs, but cannot write data to the discs.

central processing unit (CPU): The chips where all the computing takes place. The CPU is often referred to as the "brain" of the computer. It takes information from outside sources, such as memory or keyboard input, processes it and sends the results to another device that uses the information.

channel: 1) A path for passing information between devices in a computer system. 2) In communications, a means of transferring information in analog or digital form. It may consist of a physical link such as a cable or it may use infrared, radio or optical transmission.

character: Any letter, number or symbol you can use on the computer. Some characters are non-printing characters, such as a paragraph break in a word-processing program. A character occupies one byte of computer storage.

chassis: A metal frame on which computer components are mounted. Typically a server has a main chassis, containing the motherboard and other standard components, to which a number of additional chassis containing optional components can be connected.

chip: A small piece of silicon containing computer logic and circuits for processing, memory, input/output and/or control functions. Chips are mounted on printed circuit boards.

choose: To use the mouse or keyboard to select a menu item, a button or an icon.

click: To press and release a mouse button. In Windows, refers to the left mouse button, unless otherwise stated.

client: 1) A program that requests a service from another program. 2) In a network, a computer that accesses shared resources provided by the server. See *client/server*.

client/server: A network architecture in which processing is divided between the workstations (which are fully functional personal computers) and the server. The workstations handle user interaction (front-end processing) while the server handles centralized functions such as database management and print spooling.

cold boot: See *boot*.

COM1 and *COM2:* Names that the operating system gives the computer's serial ports to distinguish between them.

commands: Instructions that tell a computer and its devices what to do. You can enter commands individually, using the keyboard or pointing device, or combine them into macros or programs. See also *macro*, *program*.

communications: The means by which a computer sends data to and receives data from another computer or device.

compatibility: The ability of two computers, programs and/or devices to operate together. For example, if you install a modem that is not compatible with your computer, the modem will not work.

component: A part of the computer system. Many components are combined to create the whole system.

compression: The translation of data (video, audio, digital or a combination) to a more compact form for storage or transmission. In computer terms, files are compressed by removing repetitive and blank characters. Depending on the type of file, this can result in a size reduction of over 90%. Modems use compression to reduce the amount of time needed to send or receive a file.

computer system: A central processing unit with its associated devices, such as disk drives, keyboard and screen, and essential software such as the operating system and device drivers.

configuration: 1) The set of components in a computer system (such as memory, printers and disk drives). 2) How parts of the system are set up. For example, the configuration of the serial port includes the baud rate, parity, data bits and stop bits.

configuration (.CFG) file: A file that contains the operating specifications and attributes of a device or program, or contains information about a file or user. For an expansion board, it provides such information as switch settings, interrupts, DMA, I/O ports, and system memory.

controller: An electronic device that automatically operates a unit or regulates a process. For example, the computer's built-in disk drive controller takes information from the computer and translates it into a form usable by the hard drive. Unlike an adapter, which in its simplest form can be hardware only, a controller always includes firmware or software. A controller can take a number of forms, such as a chip on the motherboard or an add-in board. See also *adapter*, *firmware*, *hardware*, *software*.

conventional memory: The first 640 KB of random access memory (RAM) where the operating system runs programs and stores information. Also called base memory.

cursor: A symbol that indicates the current position on the screen. The shape of the cursor varies, depending on the program you're using and what you're doing.

D

data: Information that a computer can process. The word "data" is actually plural for "datum," meaning a single piece of information.

data bits: A data communications parameter controlling the number of bits used to represent a character. If data bits = 7, the computer can generate 128 unique characters, if data bits = 8, the computer can generate 256 unique characters.

decimal: The base-ten numbering system normally used by people. Computers, in contrast, generally use binary or hexadecimal numbering systems. See also *binary*, *hexadecimal*.

default: Values or options selected by the processor, a controller or a program when you do not specify a setting. For example, a preset value in a dialog box.

delete: To remove information. Examples are removing a line of text from within a program or removing files from a disk or other storage device. Synonymous with erase.

deselect: To remove highlighting from text, such as an item in a list or menu, or to remove handles from graphical objects.

device: A component attached to the computer. Internal devices are mounted on the chassis. External devices are connected to the computer via a port.

device driver: A program that controls the operation of a specific device such as the screen, CD-ROM drive or printer. The operating system loads many device drivers when you turn the computer on.

diagnostic tools: Tools used to help solve installation and configuration problems. The *Toshiba Server Setup Tool* and *System Setup Utility* are examples of diagnostic tools.

dialog box: 1) A box requesting information. Typically it contains a combination of buttons, lists and text-entry boxes. 2) A box containing a message. It may tell you that a process has completed successfully. Alternatively, it may be a warning that the computer cannot do what you asked or that obeying your instructions may destroy data. This second type of dialog box is also called a message box.

digital: Data expressed in discrete numerical units according to a predetermined code. In computing, data are expressed in binary code--an electronic pulse or no pulse, either "on" or "off." Voice and video, which usually originate in analog form, can be converted to digital signals. Voice is converted using pulse code modulation (PCM) to 64 Kbit/s.

digital signal processor (DSP): A chip designed for high-speed data manipulation and widely used in communications and data control applications. Sound boards use DSPs to handle various sound formats and filters. Modems use DSPs to handle modulation protocols.

DIMM: Dual Inline Memory Module. A unit of RAM used for memory expansion.

DIP switch: A set of tiny toggle switches built into a dual in-line package, which is mounted directly on a circuit board. The switches may be rocker-style or sliders. In both cases, the tip of a pen or pencil is required to flip the switch on or off.

Direct Memory Access (DMA): A dedicated channel which bypasses the Central Processing Unit (CPU) and enables a device to access memory directly. If two devices use the same DMA channel, the data required by one device overwrites the data required by the other--this is one type of hardware conflict. To resolve the conflict, you must reassign one of the devices to a vacant DMA channel.

directory: See *folder*.

disable: To turn a computer option off. In a menu or dialog box, a disabled option appears dim (or “grayed out”) and clicking it has no effect. See also *enable*.

disc: An optical storage medium for computer information. It consists of a shiny, non-magnetic metal platter on which information is recorded and read back using laser technology. See also CD-ROM.

disk: 1) The general term for any circular platter that can store computer information. 2) A magnetic storage medium, such as a hard disk or diskette. It consists of a platter or set of platters coated with a magnetic material and enclosed inside a protective case. See also *CD-ROM*, *hard disk*, *diskette*.

disk cache: A technique that speeds up processing. Each time your application receives data from a disk, a special program stores the data in a reserved area of memory (RAM). When the application next requests data, it looks for it first in the disk cache. Since reading from and writing to memory is quicker than using a disk drive, this can considerably improve system performance.

disk drive: The device that reads and writes information and programs on a diskette or hard disk. It rotates the disk at high speed past one or more read/write heads.

diskette: A thin, flexible diskette in a protective jacket that stores magnetically encoded information. Diskettes can be removed from the computer and come in two sizes: 5.25-inch and 3.5-inch. The server uses 3.5-inch diskettes.

disk mirroring: A technique in which the contents of a hard disk are duplicated on other hard disk(s) to protect against data loss. Any changes made to the contents of the original disk are simultaneously applied to the other disk(s).

disk striping: The spreading of data over multiple hard disks to improve performance. The technique combines a set of partitions (which must all be the same size) residing on separate disks into a single volume which the operating system treats as a logical drive. All the partitions can be accessed at once, greatly increasing data throughput. Disk striping does not inherently provide fault tolerance or error checking. It is used in conjunction with other techniques, such as disk mirroring.

display: A computer screen.

document: 1) A file containing a report, letter, user guide, etc. 2) In Windows 95, Windows 98 or Windows NT, any file that contains the information you are working on. See also *file*.

documentation: The set of manuals and/or other instructions written for the users of a computer system or program. Computer system documentation typically includes procedural and tutorial information as well as descriptions of system functions.

double-click: To press and release the mouse button rapidly twice without moving the mouse. In Windows, refers to the left mouse button, unless otherwise stated.

double-density diskette: A diskette that holds up to 360 KB (5.25-inch) or 720 KB (3.5-inch) of information.

download: 1) To receive a file from another computer through a modem. 2) To transmit font data from the computer to a printer. See also *upload*.

dpi: Dots per inch. The number of ink dots printed per linear inch. For example, a printer specification of 300 x 300 dpi means that the printer can make 300 dots per inch both vertically and horizontally.

drag: To hold down the mouse button while moving the cursor. Refers to the left mouse button, unless otherwise stated.

driver: See *device driver*.

dual in-line package (DIP): A standard for packaging integrated circuits by enclosing them in a rectangle of ceramic or plastic with downward-pointing connection pins.

DSP: A digital signal processor is a chip designed for real-time applications. DSP techniques are used in PC processors as well as media engines. For example, some high-end notebooks use a DSP chip to provide Sound Blaster emulation as well as 28.8 modem support.

duplex: The method used to transmit data in both directions between two devices. Synonymous with full duplex. See also *half duplex*, *full duplex*.

E

EISA: Extended ISA, an expansion bus design which maintains compatibility with ISA but provides a 32-bit data path and additional features. It provides much faster data throughput than ISA and is used in high performance servers.

emulation: A technique in which a device or program imitates another device or program.

enable: To turn on a computer option.

erase: See *delete*.

error-correcting code: Code designed for transmission of electronic data, that encodes data in such a way that transmission errors may be detected and corrected by examination of the encoded data on the receiving end. Error-correcting code is used in most modem and in some RAM. In the latter case, circuitry is used that generates checksums to correct errors greater than one bit.

escape: 1) To cancel the task currently in progress. 2) A code (ASCII code 27, generated by the ESC key) telling the computer that what follows are commands, not data. Used with peripheral devices such as printers and modems.

Ethernet: A local area network (LAN) standard for hardware, communications and cabling. It links network nodes in a bus topology using coaxial cable, or in a star topology using fiber-optic cable or twisted-pair cable. Normally, all nodes share the total bandwidth, which is 10 Mbps (Ethernet), 100 Mbps (Fast Ethernet) or 1000 Mbps (Gigabit Ethernet). With switched Ethernet, each sender and receiver pair have the full bandwidth.

execute: To perform a command or run a program.

executable file: A computer program that is ready to run. Application programs and batch files are examples of executable files. Names of executable files usually end with a .BAT, .COM or .EXE extension.

extended memory: Memory beyond 1MB. Windows 95/98 and NT, OS/2 and some MS-DOS programs use extended memory.

extension: See *file name extension*.

external device: Any device connected to a port on your computer. Examples of external devices are printers, tape backup units, and scanners.

F

faceplate: A protective cover that can be removed to permit the installation of an additional device.

file: A collection of related information (such as the information required for a program or document) saved on disk with a unique name. See also *document*.

file allocation table (FAT): The section of a disk that keeps track of the location of files stored on the disk.

file name: A set of characters that uniquely identifies a file within its folder or directory. It consists of two parts: the actual name and the file name extension. In Windows for Workgroups and DOS, the first part of the name is limited to eight characters. In Windows 95, Windows 98 and Windows NT, a file name can be up to 255 characters. See also *file name extension*.

file name extension: The characters at the end of a file name, starting with a period. They indicate the type of file. In Windows and DOS, extensions consist of three characters apart from the period. Examples are .EXE for program files, .HLP for help files, .BMP for bitmap files, .INI for initialization files.

firewall: A security system that prevents computers in an organization's network from communicating directly with computers outside the network. It consists of a computer system which controls access to the organization's network and routes incoming and outgoing messages. See also proxy server.

firmware: Software permanently stored in read-only memory in the CPU or in a device controller. You can update the information by replacing the ROM or reprogramming flash ROM.

flash ROM: A type of non-volatile memory that you can reprogram with software supplied by the device manufacturer. It allows you to upgrade the server or controllers without replacing the ROM.

folder (also called directory): Part of the organizational structure that allows the operating system to locate files (documents). Each folder holds a number of related files and folders (subdirectories).

font: A complete set of characters of one design and size, used to display information on the screen or output it to a printer.

format: To prepare a blank disk for use with the computer's operating system. Formatting creates a structure on the disk so that the operating system can write information to the disk or read information from the disk.

frame: An individual picture in film and video. Film has 24 fps. Video has 30 fps. With the SMPTE time code, each video frame has a unique address. On a videodisc, a frame is a block of coherent information (a picture, block of text, etc.). A videodisc contains 54,000 frames, each with a unique address.

full duplex: A type of data transmission in which data flows between two devices in both directions simultaneously. See also *half duplex*.

full-motion video: 1) Video sequences or systems that provide the number of images per second to result in the illusion of smooth motion. 2) The rate of standard video signals in the U.S. (30 frames per second) and in Europe (25 frames per second).

function keys: The keys labeled F1 through F12. They are located above the alphanumeric keys on the keyboard. Their function is determined by the operating system and/or individual programs.

G

gigabyte (GB): A unit of data storage equal to 1,073,741,824 bytes ($1024 \times 1024 \times 1024$ bytes). See also *byte*.

graphics: Information presented as drawings, pictures or other images, such as charts or graphs.

ground: A conductor to which all components of an electric circuit are connected. It is connected to the earth and is the point of reference for voltages in the circuit.

GUI (Graphical User Interface): A user interface that uses a mouse and a bit-mapped graphics display to make basic computer operations substantially easier for the user. Standard features include message boxes, a clipboard, dialog boxes, scroll boxes, WYSIWYG (what-you-see-is-what-you-get) on-screen page presentation and multiple on-screen windows.

H

half duplex: A type of data transmission in which data flows between two devices in one direction at a time. See also *full duplex*.

handles: Eight small boxes that appear around a graphical object when you select it. You can use the handles to change the size and shape of the object. Dragging the middle handle on one side of an object stretches or shrinks the object in that direction, changing its shape as well as its size. Dragging a corner handle makes the object larger or smaller while preserving its shape.

hard disk: A storage device composed of a rigid platter or platters that store information magnetically. Hard disks hold much more information than diskettes and are used for the long-term storage of programs and data. The primary (or only) hard disk in a personal computer is usually fixed, but some computers have secondary hard disks that are removable. In a server, all hard disks may be removable. By default, the primary hard disk is referred to as drive C.

hardware: The physical, electronic and mechanical components of a computer system, including devices such as a screen, disk drive, printer, mouse and processor.

hexadecimal: The base-16 numbering system used by programmers to represent binary numbers. Digits above 9 are represented by letters (the 16 digits are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E and F). Two hexadecimal digits are equivalent to the eight bits in a byte. For example, F1 in hexadecimal is equivalent to 11110001 in binary. See also *binary*, *decimal*.

high-density diskette: A diskette that holds 1.2 MB (5.25-inch) or 1.44 MB (3.5-inch) of information.

hot-swappable drives: Drives that you can install or remove without using screws or cables and without powering down the server.

hub: A central connecting device in a network that joins communications lines together in a star configuration. A switching hub also routes messages and packets among the computers connected to the network.

hypermedia: A method of providing multiple connected pathways through a body of information, allowing users to jump easily from a topic to related or supplementary material, which may be text, graphics, audio, images or video.

HyperText Markup Language (HTML): A special coding scheme used to prepare text and graphics for access over the World Wide Web.

icon: A small picture that represents a function, file, or program.

Industry Standard Architecture (ISA): An expansion bus design that provides a 16-bit data path with 16-bit and 8-bit slots. A 16-bit expansion board can use two adjacent 8-bit slots. See also *EISA*.

infrared port: A port that allows data to be transferred by infrared signals instead of a cable. It works on the same principle as a remote control for a television set.

input: Information received by a computer from a storage device such as a disk, or an input device such as the keyboard.

input/output (I/O): Input and output are two of the three functions that computers perform (the other is processing). Input/Output describes the interrelated tasks of providing information to the computer and providing the results of processing to users. I/O devices include keyboards (input) and printers (output). A disk drive is both an input and an output device, since it can both provide information to the computer and receive information from the computer.

instruction: A statement in a computer program that performs a particular function or task.

Integrated Services Digital Network (ISDN): A world-wide communications network for delivering telephone and data services. It uses two types of communications channel: a B channel which carries voice, graphics and data at 64 Kbps, and a D channel which carries control information for signalling at 16 Kbps. A basic ISDN installation typically provides two B channels and one D channel.

Intelligent Input/Output (I₂O): A standard for offloading input and output to an auxiliary processor. The auxiliary processor (I/O processor) manages the data transfer while the CPU does something else.

interface: A connection between two parts of a system that lets them work together. There are different types of interface: 1) Elements such as the graphics design, prompts and menus of a program allow you to interact with the program. These elements make up the user interface. 2) A physical connection between one system or device and another so that information can be exchanged.

interlaced: A method of refreshing a computer screen, in which only every other line of pixels is refreshed. Interlaced monitors take two passes to create a complete screen image.

Internet: The collection of computers located throughout the world that are connected over telephone lines to provide electronic mail and other services.

Intranet: World Wide Web pages designed to serve a limited group of people, such as the employees of a particular company. Users must enter a password to access the information provided.

K

keyboard: The device you use to type information into the computer. Each key on the keyboard is a switch that is activated when you press it. The switch sends a specific code, representing the character printed on the key, to the processor.

keyboard shortcut: A key or combination of keys you use to perform a task instead of using a pointing device, such as a mouse.

kilobyte (KB): A unit of data storage equal to 1024 bytes. Although kilo means 1000, for computers it refers to 1024, or 2 raised to the 10th power. See also *byte*.

L

laser disc: Reflective-optical videodisc, recorded and read by laser light.

legacy device: 1) A peripheral device or card that does not have Plug and Play capability built into it. 2) In networking, a device that is designed to work with proprietary communication protocols instead of conforming to open standards.

light-emitting diode: A semiconductor device that emits light when it receives an electric current. Used for indicators like disk activity lights.

liquid crystal display (LCD): A type of display that uses a liquid substance between two transparent electrode panels. By selectively turning the electrodes on and off, the LCD creates the images you see on the screen.

load: To move information from a storage device (such as a CD-ROM) into memory, making it available to the computer for processing.

local bus: A type of bus that connects devices directly to the microprocessor. Because there are no wires between the CPU and the device, information is passed at a much greater speed than through the system bus. See also *bus*.

logical drive: A section of a disk that is recognized by the operating system as a separate disk drive. A system's logical drives may differ from its physical drives. For example, a single hard disk drive may be partitioned into two or more logical drives.

M

macro: A named sequence of instructions within a programming language or application. A macro may be predefined in the language or application, or you may define your own macros for procedures you use frequently. The macro name enables you to call up the sequence of instructions when you need them.

main board: See *motherboard*.

math coprocessor: A special processor that performs arithmetic calculations on exponential numbers. Since a computer's main processor calculates with integers, a math coprocessor can greatly improve system speed if you work with large spreadsheets or some graphics programs. Some processor chips include a built-in math coprocessor.

megabyte (MB): A unit of data storage equal to 1024 KB. Although mega means million, one megabyte is actually 1,048,576 bytes (1024 x 1024 bytes).

memory: Chips the computer uses for temporary information storage. Information in memory is available to the computer for processing. Two types of memory are Random Access Memory (RAM) and Read-Only Memory (ROM). See *Random Access Memory* and *Read-Only Memory*.

menu: A list of options on the screen, from which you can choose.

microphone: An input device that converts sound into electronic signals that can be recorded or amplified.

microprocessor: A single integrated circuit (“chip”) that executes instructions, and monitors and controls functions. One such chip forms the Central Processing Unit (CPU) of a computer.

MIDI (Musical Instrument Digital Interface): A standard for connecting musical instruments, synthesizers and computers. The MIDI standard provides a way of translating music into a form computers can use, and vice versa.

MIPS (Millions of Instructions Per Second): A means of measuring a computer processor’s performance.

mode: An operational state or method of operation, for example, Sleep Mode.

modem: A device for transmitting computer information over telephone lines. A modem converts (modulates) digital information for transmission and also converts (demodulates) information it receives back to digital format. Many modems also interpret and execute commands received from the computer.

monitor: An external device that uses rows and columns of pixels to display alphanumeric characters or graphical images. A cathode ray tube (CRT) is a common type of monitor.

motherboard: The main printed circuit board in the computer. It contains the processor chip, memory and other major system components. Sometimes called the main board.

MPC (Multimedia PC): A specification developed by Tandy and Microsoft for the minimum platform capable of running multimedia software. PCs carrying the MPC logo can run any software that also displays the MPC logo.

MPEG (Motion Picture Experts Group): Proposed universal standard for the conversion of analog video images to a digital format. MPEG is a working committee under the auspices of the International Standards Organization (ISO) that is attempting to define standards for digital compression/decompression of motion video/audio for use in computer systems. Its first priority is to develop methods for encoding video within the 1.5 Mbit/second CD-ROM data rate. As an evolving standard, MPEG-2 extends MPEG compression and decompression capabilities.

multimedia: A combination of two or more elements, such as sound, animation and video in a computer program or presentation. Multimedia programs, which require huge amounts of storage space, have become very popular with the wide availability of CD-ROM drives.

multiprocessing: The simultaneous execution of different programs or of different parts of the same program by two or more CPUs installed in the same computer.

multitasking: A technique in which the computer runs one program for a short time and then switches to the next program. Because people's sense of time is much slower than the computer's speed, the programs seem to run simultaneously.

N

network: A collection of interconnected, individually controlled computers, together with the hardware and software used to connect them. A network allows users to share data and peripheral devices, such as printers, and to exchange electronic mail.

Network Interface Controller (NIC): A controller that acts as the communications interface between a personal computer and a network.

Netware Loadable Module (NLM): A program you load and unload while the server is running. Four types of NLMs exist: management utilities and server application modules, disk drivers, LAN drivers, and name space NLMs.

non-interlaced: A method of refreshing a computer screen, in which each pixel of every line is refreshed as the electron beam scans across and down the screen.

non-system disk: A disk for storing programs and files that cannot be used to start the computer. See *system disk*.

non-volatile memory: Memory that retains data in the absence of an external power source.

O

off line: Not currently connected to or under the control of the computer. Used to refer to equipment such as disk drives and printers.

on line: A functional state in which a device is ready to receive or transmit information.

online: Available through the computer. Online may refer to information on the hard disk, such as online documentation or online help, or a connection, through a modem, to another computer or the Internet.

online spare: A hard disk drive used in disk mirroring and other fault tolerance techniques to replace a failed drive without user intervention.

orphaned partitions: These occur in disk mirroring when the drive containing the master partition fails. If a drive containing a duplicate partition fails, the system marks the master partition as unmirrored.

operating system: A set of programs that controls how the computer works. Operating system functions include creating programs and data files, and controlling the flow of information between the processor, memory and devices. Examples of operating systems used by computers are MS-DOS, Windows 95 and Novell NetWare.

operating system disks: The disks containing the operating system. Also known as system disks.

output: The results of a computer operation. Familiar forms of output are information 1) printed on paper, 2) displayed on a screen, 3) sent through the serial port or internal modem, or 4) stored on disk. See also *input/output (I/O)*.

P

palette: In some programs, a palette is a collection of drawing tools, brush widths, line widths, and colors. In other programs, the palette determines the number of colors that can be displayed on the screen.

parallel: Two or more processes or events that can happen at the same time without interfering with each other.

parallel interface: A type of information exchange that simultaneously transmits all the bits representing a character. It uses a separate line for each data bit in a byte. In contrast, a serial interface transmits characters along a single data line one bit at a time, making it much slower than a parallel interface.

parity: A method in serial communications of making sure that the information received is the same as the information that was sent. It consists of adding an error detection bit to a group of data bits, making the sum of the bits either odd or even. When you're using a modem to connect to another computer, you can set parity to none, odd or even. In general, you should set parity to none, unless you're requested to do otherwise.

password: A unique string of characters used to identify a specific user or group of users for security purposes. A password prevents unauthorized use of the computer.

path (full path): The unique identifier for a file consisting of the file name preceded by the drive, the top-level directory or folder and any lower-level directories or folders.

peripheral devices: Computer devices other than the CPU and memory. A peripheral device may be internal (inside the case), or external (outside the case).

Peripheral Component Interface (PCI): A local bus that provides a high-speed data path between the CPU and up to 10 peripheral devices. It supports both multiplexing and the Plug and Play standard. In a Pentium PC, there is generally a mix of PCI and ISA expansion slots or PCI and EISA expansion slots.

pixel: A picture element. The smallest dot that can be produced on a screen or printer.

Plug and Play: A design standard that hardware manufacturers use to produce devices that can be configured automatically (provided you use Windows 95 or Windows 98).

pointing device: Any device, such as a mouse or trackball, that enables you to move the cursor on the screen.

port: A socket on the computer where you plug in a cable for connection to a network or a peripheral device. It provides the electrical connection through which the computer sends and receives information. Standard ports include parallel and serial ports.

power on features: Features the server updates whenever it is turned on, such as date, time and the Num Lock key state.

Power On Self Test (POST): A set of routines that are stored in ROM and performed when you start or reset a computer. They test system components such as the processor(s), memory, disk drives, mouse and keyboard to make sure they are connected and working correctly.

power up: To turn on a computer, or any peripheral device that has its own power supply.

processor: See *central processing unit*.

program: A set of instructions that tells the computer what to do. Programs call for information (input), which is entered at the keyboard or by means of a pointing device, or obtained from a file. The computer processes the data, according to the instructions in the program, and sends the results to a device such as a screen, a printer or a disk. See also *application*, *macro*, *utility*.

prompt: An audible or visible signal, such as a beep or a screen message, that tells you that you need to do something or that a process is complete. See also *system prompt*.

properties: Windows 95, Windows 98 and Windows NT treat windows, icons, applications, disk drives, documents, folders, modems, and printers as self-contained objects. Each object has its own properties, such as the object's name, size, position on-screen, and color. You can change an object's properties using the Properties dialog box. See Windows Help for more information on changing properties.

protocol: A set of rules and conventions that makes it possible to transfer information between computers. If you're transmitting a file, both modems must use the same protocol—just as two people talking on the telephone must speak the same language to communicate effectively.

proxy server: 1) An application that forms part of a firewall by breaking the connection between the sender and receiver. It intercepts requests for information, decides whether they should be fulfilled and passes them on to an internal server. It therefore prevents outsiders from obtaining internal addresses and details about a private network. Also called proxy. 2) A server that stores frequently requested data, such as popular Web pages, to reduce network (or Internet) access.

R

radio frequency interference (RFI): All computer equipment generates radio frequency signals. The FCC regulates the amount of RFI a computing device can leak past its shielding. A Class A device is sufficient for office use. Class B is a more stringent classification applying to equipment for home use. Toshiba desktop and notebook computers are Class B devices, Toshiba servers are Class A.

radio frequency interference (RFI) shield: A metal shield enclosing the printed circuit boards of the printer or computer to prevent interference with radio and TV reception.

random access memory (RAM): High-speed memory which holds a copy of the operating system, any currently executing programs, and any information undergoing processing. RAM is volatile, which means that all information in RAM is lost when its power supply is turned off.

read-only memory (ROM): A type of memory which the computer can access but cannot change. It contains information that controls the computer's basic operation. ROM is non-volatile memory, which means that the information stored in ROM is permanent—it is not lost when you turn off the computer.

real time: An operating mode in which data is received, processed, and the results returned immediately.

reboot: See *boot*, *restart*.

Redundant Array of Independent Disks (RAID): A group of hard disks that are managed as a unit to provide increased performance and various levels of error recovery and fault tolerance. The technique can be implemented in software using standard disk controllers, or it can be designed into the disk controller itself.

Registry: The central information database for Windows 95/98 or Windows NT. It holds hardware-specific information and stores configuration details for programs, reducing the need for initialization (.INI) files.

remapping: Redefining a computer component. For example, remapping the keyboard refers to assigning a new symbol or letter for some or all of the keys.

remote console: An input/output device that consists of a keyboard and monitor and is physically separate from the computer to which it is connected.

removable disk: A disk that can be removed from the computer and used to transfer files to another computer or to hold backup copies. Diskettes are an obvious example, but removable hard disks are available. In addition, there are high capacity removable disks which only work in proprietary drives.

resolution: A measure of the sharpness of the images that can be produced by a printer or displayed on a screen. For a printer, resolution is expressed in dots per inch (dpi). For a screen, it is expressed as the number of pixels available horizontally and vertically.

restart: Resetting a computer without turning it off (also called “warm boot” or “soft reset”). To restart the computer while it is on, press Ctrl + Alt + Del or press the reset button. In Windows 95/98 and Windows NT, you can also use the Restart option on the Shut Down menu. See also *boot*.

resources: 1) Any part of a computer system or network that can be allocated to a program. Examples are printers and disk drives. 2) Data channels and storage areas that can be allocated to devices. Examples of these system resources are memory, interrupt request (IRQ) lines, direct memory access (DMA) channels, and port addresses. On the server, you use the Toshiba System Setup Tool to configure system resources.

riser card: An expansion card that is used to physically extend a slot for a chip or card in a fully-loaded computer to make room to plug it in. It may also refer to a card that contains several slots used in low-profile, space-saving cabinets. The cards are plugged into the riser card and reside parallel with the motherboard.

RJ-11: A modular telephone connector used on most telephone networks and direct-connect modems.

RJ-45: (Registered Jack-45) A telephone connector that holds up to eight wires. RJ-45 plugs and sockets are used in 10BaseT Ethernet and Token Ring Type 1 devices.

root directory: The directory on a disk at the “top” of the directory (or folder) structure. All subdirectories (folders) on the disk connect directly or indirectly to the root directory. In MS-DOS, the root directory on drive C is referred to as C:\.

router: A device that routes data packets from one local area network (LAN) or wide area network (WAN) to another.

RS232-C: The standard defining control, data and status signals for cables allowing asynchronous communication with computers, printers, and other peripheral devices.

S

SCSI channel: A standard communications protocol for external and internal device expansion, such as hard drives, tape drives, and CD-ROM drives.

SCSI ID: A unique identifier assigned to each SCSI device connected to a SCSI bus. The ID number defines the device address and determines the device priority on the bus. ID 7 (SCSI controller) is the highest priority; ID 0 is the lowest.

select: To highlight text or display handles around graphics.

serial: The handling of data bits one after the other.

serial communications: A communications technique that uses as few as two interconnecting wires to send bits one after another.

serial interface: An interface between systems or system components in which information is transmitted sequentially, one bit at a time. The transmitted bits are reassembled at the receiving component. A modem uses a serial interface.

serial port: A communications port (COM1 or COM2) to which you can connect a serial device, such as a modem, a mouse or a serial printer.

server: A computer or program that provides information or shared resources in response to external requests. For example, a file server stores on its hard disks the programs and data files for all the workstations in a local area network (LAN).

session: The time during which a program is running. For example, an MS-DOS session under Windows is the time during which you execute MS-DOS commands or run an MS-DOS program.

shortcut: 1) A feature of Windows 95/98 and Windows NT that allows you to use an icon to open folders and documents and their associated programs, to start programs directly or to move from folder to folder. 2) A keyboard shortcut.

SIMM: Single In-line Memory Module. A unit of RAM used for memory expansion.

Small Computer Systems Interface (SCSI): A standard interface providing an expansion bus for connecting devices such as disk drives to a computer. You can connect up to seven SCSI devices to a single SCSI port.

software: The computer programs or instructions that tell the hardware what tasks to perform. The general classes of software are operating systems, applications and utilities.

Stand by: A feature in Windows 98 that, like Windows 95's Suspend command or Toshiba's Resume Mode, allows you to turn off the computer without exiting your applications and to continue from where you left off when you turn on the computer again.

stop bit: In asynchronous serial communications, one or more bits indicating the end of a block of characters.

synchronous: Having a constant time interval between successive bits, characters or events. Synchronous data transmission requires both the sending and receiving devices to use special synchronizing characters to correct variations in timing between the devices. See also *asynchronous*.

system disk: A diskette that contains the operating system files that are needed to start the computer. Any physical diskette can be formatted as a system disk. A system disk is also called a bootable disk.

system prompt: In MS-DOS mode, one or more characters that indicate that the operating system is ready for you to enter a command. You can enter an operating-system command or start a program from a system prompt.

System Configuration Information file (.SCI): This file allows you to create a backup of the configuration and store it. You will be able to restore the system configuration from the .SCI file.

striping: See *disk striping*.

swap area: An area of hard disk that acts as an extension of RAM. Programs, or parts of programs, that are in active use but currently in a waiting state can be shifted to this area (swapped out) so that others can run in RAM. It is a form of virtual memory. Also called a swap file.

T

terminate-and-stay-resident (TSR): A type of program, also called memory resident, that stays in memory even when you aren't using it.

terminator: A hardware item that must be installed in the last device connected to a bus to control noise and prevent the signal from oscillating.

token ring: A type of LAN that uses the token-passing access method with a ring topology.

tracks: One of several concentric rings on a diskette or hard disk that defines a distinct area of data storage. Tracks are encoded on the disk during formatting.

U

Uninterruptible Power Supply (UPS): A device connected between a piece of electrical equipment, such as a computer system, and the AC power source to protect against transient power conditions and short-term power outages. A UPS unit contains a power-level sensor and a battery. If the sensor detects a loss of power, it switches over to the battery giving you time to save data and close down the system.

upload: To send a file to another computer through a modem. See also *download*.

utility: A computer program that lets you modify how certain aspects of your computer function. Utilities differ from applications because you don't use them to do real work—they just make your life easier. Different utilities manage fonts, compress files and check for viruses.

V

volatile memory: Random Access Memory (RAM) that is capable of storing information only as long as the computer is turned on.

W

Wake on LAN (WOL): The Wake on LAN function turns on the server when the client PC sends the necessary code.

warm boot: Restarting the computer without turning it off. See also *boot*, *restart*.

.WAV file: Digital audio uses computer-based technology to record, handle and recreate sound. Digital audio systems sample the waveform at fixed time intervals and reduce the sound to a sequence of numbers. When you play back a digital waveform or . WAV file, the software transforms the numeric data back into its original acoustic waveform.

window: A portion of the screen that can display its own application or document.

wizard: A helpful online tutor that guides you through common procedures or processes, as in hardware wizard.

World Wide Web: The international network of home pages linked together over the Internet by hypertext jumps. A user of the WWW can jump from page to page regardless of the location of each page.

write protection: A safeguard that physically prevents you from deleting the information on a diskette or other storage media. 3.5-inch diskettes have a small square hole with a plastic tab. To protect information on the diskette, slide this tab to uncover the hole.

Z

zoom: A feature in many applications that makes an object on the screen smaller or larger.

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